

# SUPPLEMENT.

## The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

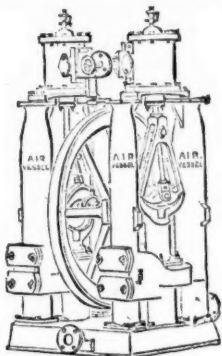
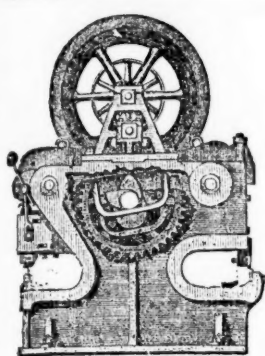
FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2010.—VOL. XLIV.

LONDON, SATURDAY, FEBRUARY 28, 1874.

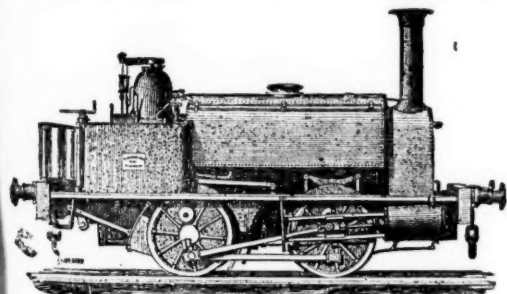
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TION," in Dublin, 1855; at the "UNIVERSAL EXHIBITION," in Paris, 1867;  
at the "GREAT INDUSTRIAL EXHIBITION," at Altona, in 1869; and at the  
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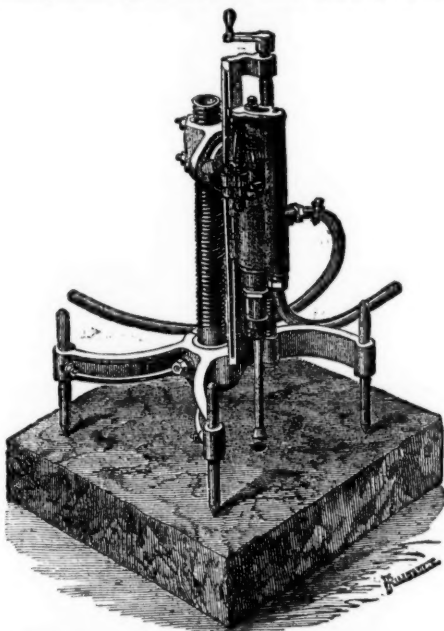


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It may be had of all dealers in leather, and of—

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**THE ANTI-CONCUSSION DRILL.**—This machine is specially adapted for driving levels, adits, or tunnels. It works without concussion, and therefore does not wear out. Has driven as much as 53 yards of drift in one month, where hand labour could only progress 8 yards in the same time. Forty-four of these machines are at work in a single colliery. Price £105.

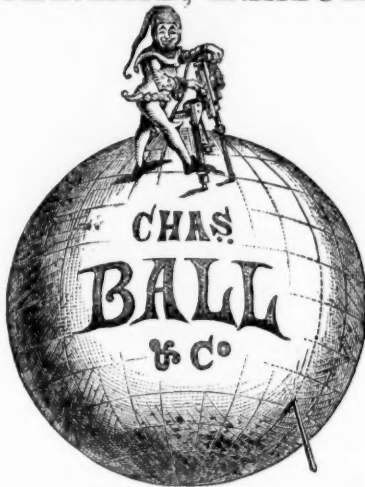
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Each of these Drills is a different Patent, constructed on a separate and distinct principle.



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**DRY SYSTEM.**—Cheap and simple—six sizes.

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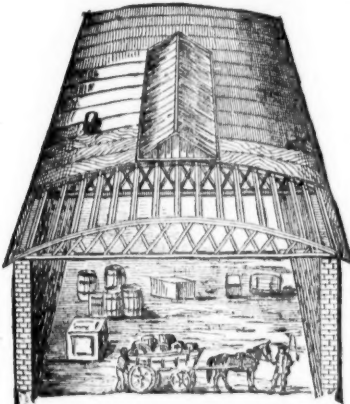
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By hand - - - - - 8 yards per month.  
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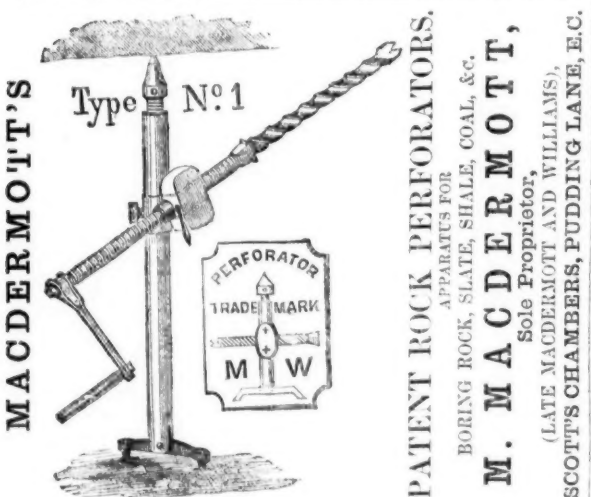
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For particulars, estimates, and plans, address,—  
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The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds farm buildings, &c., the principal of which are double bow and string girders of best pine timber, sheathed with ½ in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 60s. per square, according to span, size, and situation.

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INODOROUS FELT for lining damp walls and under floor cloths.  
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PATENT ASPHALT ROOFING FELT, price 1d. per square foot.  
Wholesale buyers and exporters allowed liberal discounts.

PATENT ROOFING VARNISH, in boxes from 3 gallons to any quantity required 8d. per gallon.



This is the best hand-worked implement for colliery purposes extant. It can be carried about, set up, taken down, and worked by one man. It bores vertically upward as well as in any other direction. The rate of work is at least four times as great as by the usual methods. The hole made is straight and uniform, and, therefore, specially adapted for the use of cartridges.

Price list and description, with list of places where the Perforators are in use, on application as above.

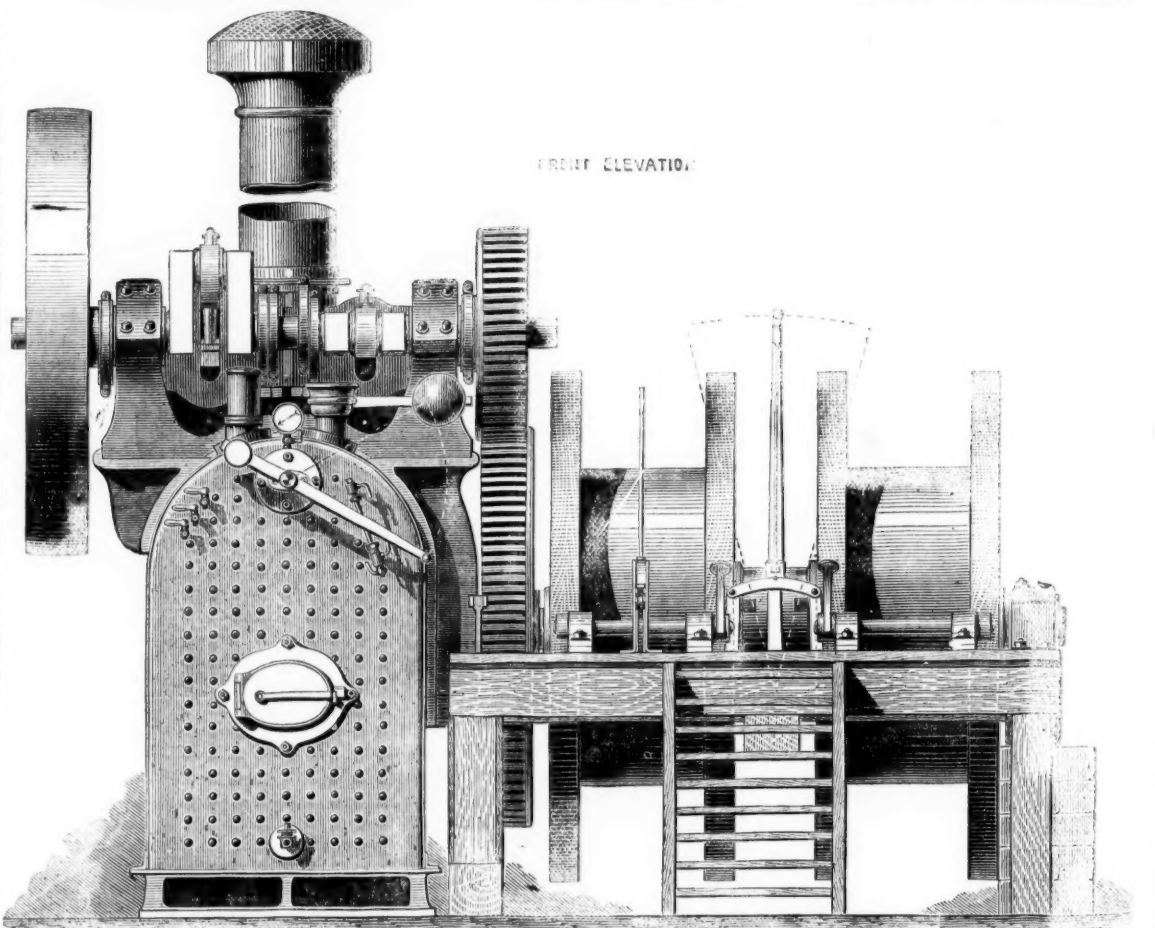
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FRONT ELEVATION.

FROM 20 TO 200 EFFECTIVE HORSE-POWER.

FOR FULL PARTICULARS AND PRICES, APPLY TO—

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ALSO OF PATENT PORTABLE  
**HAULING & WINDING ENGINE**

WITH  
**PATENT DRUM WINDLASSES,**  
FOR MINING PURPOSES.

This Engine is specially commended to Mining Engineers and others, as by its adoption—

Haulage along inclined drifts is easily and cheaply effected;

The expense of sinking new shafts is greatly reduced, neither foundations nor engine-house being required

It is available not only for winding, but for pumping, sawing, &c.—a great desideratum at a large colliery;

It can be very quickly removed (being self-propelling), and fixed in any desired position.

Prices and full particulars on application as above, and also references to view the engine in successful work near Derby Carnarvon, Haverfordwest, Darlington, Durham, Penzance, and other places.

THESE ENGINES WORK WITH MARVELLOUS ECONOMY IN FUEL.

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Manufacturers of

**CRANE, INCLINE, AND PIT CHAINS,**

Also CHAIN CABLES, ANCHORS, AND RIGGING CHAINS, IRON AND STEEL SHOVELS, SPADES and FORKS, ANVILS, VICES, SOYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS, RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions.

STOURBRIDGE FIRE BRICKS AND CLAY.



## Original Correspondence.

## THE RICHMOND CONSOLIDATED MINING COMPANY OF NEVADA, AND ITS TRADUCERS.

SIR.—The various issues of your extensively-read Journal that have within the past six months reached this far-away portion of Uncle Sam's domain have not been without special interest to many of its readers here. That this manifestation of an interest we may be supposed not to have felt was after all natural enough under the circumstances, and will not be doubted is tolerably certain, when it is understood that our residence here—close to the mine and reduction-works of the above incorporation—ought to entitle us to a knowledge of facts in relation to its unrivalled property infinitely more correct than anything emanating from the busy pens and imaginative brains of the anonymous scribblers whose essentially *ex parte* statements have from time to time been aired in your interesting pages. Through what secret channel or underground line may I be permitted to ask did these Munchausen writers derive the valuable information they would have us believe they possessed of the unworthiness of the Richmond as a field for profitable investment? Not from the mine or its efficient officials certainly. The weekly cables and monthly returns regularly submitted by themselves, in obedience to orders, would altogether destroy this theory of the case, and leave but little hope for a more satisfactory solution of the question being reached than that the aforesaid gentlemen drew as largely upon their fertile imaginations for what they wrote, in relation to the declining fortunes of the Richmond, as did the oily-tongued vendors of the famous Emma for their highly-coloured, romantically-written reports of its inexhaustible but, alas! now vanished wealth. It is truly amazing to note the cool effrontery and simulated confidence of these philanthropic gentlemen, and their apparently gracious matter-of-fact manner of looking after the interests of the public of London in this out-of-the-way region. That these exponents of unconfirmed facts have never been gladdened with even a cursory glance at the underground riches of this almost fabulously valuable mine which they have so glibly traduced is more than certain, otherwise I am charitable enough to believe they would have hesitated ere they disregarded the plainest truths laid down by ethical moralists. It is not my purpose in the space I have allowed myself to follow these gentlemen any further, or to enter into an extended analytical enquiry as to the character of the motives that induced them to pester the public with their hazy, untruthful communications. Lest, however, they or others may deem my censorship, if such it may be called, liable to the charge of being influenced by personal considerations or pecuniary reward for what I have or might say in connection with this subject, I will state that I am not interested in the welfare of the Richmond to the extent of a single share, nor do I hold a position of either trust or profit, or expect to, under the company in whose interests it might be said I write. I make these statements, which can be borne out if necessary by friends in Europe, in order that my motives for making them may not be misconstrued or distorted from the true intent of giving them publicity.

Any person whose judgment is not warped by purely personal considerations could not do otherwise than extol the Richmond, and exult over the vast wealth brought to light by the vigorous prosecution of developments that reflect the greatest credit upon the judgment and experience of its present successful superintendent, Mr. J. B. McGee. Nowhere within the boundaries of Nevada, outside of the Comstock, is there so remarkable or valuable a mine as it is showing itself to be. The imagination alone is incapable of grasping at anything like even an approximate idea of the vastness of its ore body, or of even venturing upon the thought of the glorious future that awaits it. Each successive step of development vertically, longitudinally, and laterally but adds the most indisputable evidence in support of this assertion; and why its shares should remain at present figures, while less worthy ones are bought and sustained, is one of the mysteries I have been unable to solve with satisfaction to myself. I will, too, while on this particular portion of the subject, hazard the opinion that had the Richmond had been stocked in San Francisco instead of in London, and to present the same cheerful features to invite investors that it does at present, its shares would command nearly double the price they do now. These are facts so notoriously well known and spoken of here that they need no outside confirmation. Yet when we take into account the causes that have contributed to the want of a proper appreciation of its shares, as viewed from a speculative standpoint, we cannot but confess, in the light of past experience, that after all it is not so unnatural as one would at first glance suppose it to be. We in this country who look to foreign capital and influence for the means to open up the inexhaustible mineral resources of our mines, are now sensibly suffering in pocket and reputation from the dishonest acts and nefarious practices of that large class of our floating—here to day and away to-morrow—population, to whom permanency, honour, and reputation are but empty baubles, when compared with the visions of the sudden riches and rewards to flow to them from some brilliant coup like the Emma, Mineral Hill, Pinto, or Last Chance affairs. The histories of these mines, particularly that of the former, will be remembered till latest time as being in the category of some of the popular delusions of the day. There are other well-known things, too, that go far to account for much of the deplorable losses sustained in this country by English investors. Men are not unfrequently selected by boards of directors not so much on account of their ability and skill, either as miners, mineralogists, or metallurgists, but for some other quality either real or imaginary they are supposed to possess, to fit them for the onerous and responsible position of superintendents. Influence, too, I regret to add, is often unjustly used to induce their appointment to positions for which they are in nowise fitted by practical acquaintance with the duties involved. This charge cannot, however, be laid at the doors of the gentlemen having the management of the Richmond in charge. Its present superintendent, as well as the foreman under him, at the mine have been found eminently qualified for their respective posts. The management is, therefore, all that could be desired—honest, reliable, and worthy of the highest confidence of the public. The cablegrams and reports, too, furnished regularly from here, have been based upon something more solid than the arguments already referred to, which would have us believe them to be mythical, and manufactured out of whole cloth. In a word, that the dividends already disbursed have been realised from borrowed money, for which a high rate of interest has been and is paid. Nothing can palliate the absurdity of these assertions. They are as wicked in thought as they are known to be untruthful in character, and hence are unworthy of our attention.

The mines included in the Richmond Consolidation are known to be the most valuable in Eastern Nevada, and are also but little inferior to many of the mines on the famous Comstock lode. These mines are situated on the north-western and north-eastern slopes of Ruby Hill, and about 2½ miles due west of Eureka. They are reached by a good road, lately built by the company to facilitate the transportation of ore to their furnaces. The amount run from these monsters is truly wonderful, for their reduction capacity is 150 to 180 tons of ore each 24 hours when the three are in full blast.

The Lizette Tunnel, through which the property is worked, has a curved length of something over 600 feet to the top of the Rossiter incline. This incline at the present time of writing has a depth of 200 ft., run at an angle of inclination of 40° or 44°, and cuts through a portion of the western footwall midway in its descent to the bottom of the north-western chamber, all the distance through the finest quality of carbonate, oxide, and galena ores. In this bottom chamber, a few feet from the bottom of incline, 200 ft. from the level of the Lizette Tunnel, is a winze commenced in December last. On the 26th of that month the writer, in the company of Mr. J. J. Corrigan (president) and Mr. J. B. McGee (superintendent), visited the mine, and found this winze down about 13 or 14 feet vertically. It has since then attained a depth of 70 or 75 feet, through ore of a very superior grade to that found so abundantly above, thus proving beyond cavil the continued depth of the lode, and the value and permanency of not only this unrivalled property, but of the others of the district. Its course appears to be north-west and south-east, and dipping north-east at an angle of 28° or 30°.

The mine is, indeed, wonderfully rich in the amount and quality of its ore thus far exposed to view, and is without any attempt at exaggeration, should there be no further developments made, sufficient to run the company's furnaces for the next two years or more. These are facts that need no confirmation, for they have been borne out by facts already too well established to be doubted.

The value of this property will be enhanced, too, as soon as the narrow-gauge railroad, now in process of construction from the palisades, is completed to Eureka. The shipments of bullion will cost less than at present, and coal can also be laid down for much less than it costs now at the furnaces, for the Sierra Nevada mountains will furnish the finest timber in the State for charcoal purposes.

These and the foregoing facts ought to be magical in their influence in bringing a smile of undisguised satisfaction to the features of the lucky shareholders of Richmond, as the pleasuring of recording them does to the heart of your correspondent.

J. D. POWER.

Eureka, Nevada, Feb. 2.

## MINING IN UTAH.

SIR.—The news from Utah, owing to our winter season, is not very startling, still there is a freshness about a late *expose* that may be of interest to your readers. Mr. R. Mackintosh, who runs a sampling works, came out in a card against a stranger called Mr. Scott, of Detroit, alleging Scott had tried to bribe the foreman of his works, and he cautioned the public against him, calling him some very hard names. Scott came out with his card, placing himself on patriotic grounds, such as doing the public a favour, by showing up the men whom he could buy.

This brought forth several articles from outsiders, and the two principals seemed to get the worst of the job. In fact, the whole mining world do not see Mr. Mackintosh as he wanted they should see him, or at least as he expected they would. His business has been curtailed to the simple sampling of the Emma ore, which was given him by Warren Hussey, President of the first National Bank when he (Hussey) had the management of that concern.

The Flagstaff itself is first-class, but the season of the year is against rapid work. Capt. Forbes had it then in paytime, but he left a stock of debts it will take all Patrick's ability to get rid of. The Davenport is very sick owing to bad management, and the quarrels going on upon your side of the water, and the impression is here pretty firmly fixed there is no hope for that company. The Bingham companies are doing somewhat better than those of the Cottonwood; but the Mammoth Copperopolis of Tintic, with their splendid mine, seem to have got into the mud so deep that one wonders what kind of men must have had the control. Rats that make holes can be the only solution to this question. Other than the above there is no news; all are expecting a very rapid and brilliant year for Utah in 1874.—Salt Lake City, Feb. 5.

W. J. S.

## MINING IN UTAH.

SIR.—The letter of "Timpanogos," dated Dec. 12, Salt Lake, has reached here, and created not a little sensation. I do not concur in "T's" statements, and shall only refer, as a proof to the contrary, to the financial status of several of our American mines. How is it that the Reed and Benson and the Vallejo, in the Wasatch range, the Mono, in Dry Canyon, the Crismon Copperopolis, in Tintic district, are actually flourishing and prosperous? True, they have not a triple management, a multifariousness of administrations, an army of sinecures; they husband their resources, they adapt ends to means, and do not feed on visionary expectations. Still the adage, "that crows do not hack out each other's eyes," is certainly at fault in Utah operations. With commendable impartiality American as well as British investors have been fleeced in the transfer of mining properties. I need only mention the Stafford and Lone Star, in Camp Floyd—the Eureka, in Tintic, to recall to mind some of the most glaring infamies of the most brazen-faced deceit that was ever known in the annals of mining history. In the former case, two prospect holes, situate in a district famous for its barrenness and the irregularity of its deposits, were sold to the "bone and sinew" of New Orleans; in the latter, the famous Eureka Mine was salted on an Eastern capitalist, noted for his uprightness and integrity, Mr. Eber W. Ward, of Detroit. That in both cases all the artifices known to the profession—such as preparing the mine, salting the experts, flaming reports, &c.—were resorted to need hardly be said. But a few days ago an attempt was made to carry out a fraudulent sale of ore, by corrupting the samples at the Salt Lake Sampling Mills. The instigator, fortunately, was caught in the very act; but, nothing daunted, he advanced the specious plea of having tested the probity of the operatives employed in the mill. The argument needs no comment. Like so many others, it illustrates the utter irresponsibility peculiar to American life, not alone in its mining but in its general industrial pursuits. The idea of proposing a Government (or otherwise responsible) inspector to such establishments does not seem to have occurred to anyone; stirred by the event, perhaps, a step will be taken excluding from the premises all interested persons, and making the sampler directly responsible for the full money value of his invoices. This, with the opportunity offered (as it now is at Salt Lake) of having the sample returns tested at rival establishments, ought to satisfy the most fastidious; but how lamentable, that years should be allowed to foster prevarication, to defraud companies and individual owners, and to undermine the wavering credit of the Territory! A decent sense of self-respect, if not the best interests of the sampler personally, should have prompted these men long ago to suggest such a highly necessary step themselves. There is a sad lesson in all this. Individual sense of honour ought to make certain legislation superfluous; but wherever that initiative is wanting, Government has the duty to see that the good faith of its citizens or aliens be not victimised by reckless adventurers and designing schemers. A Government which will allow its legitimate industries to be decieved, its honourable callings to be degraded, and encroachments and impositions being practised on *bona fide* investors, is truly the one that deserves to be held up to the stigma of the whole world. It is the one, too, that entrusts the lives of its citizens to quacks, its justice to shysters, and the wealth of its nation to financial mountebanks.

Another case in point will illustrate the system. About a year ago a mining agency was opened in this city by — and —, both English "gentlemen" and self-styled mining brokers, in connection with some Americans. The office proposed to carry on the purchase and sale of mines and real estate, the examination of mineral deposits, titles, &c. In this office maps were made by persons ignorant of the principles of surveying; reports drawn up from hearsay, and mines offered for sale without the consent or even knowledge of the actual *bona fide* owners. The concern died a precocious death; had it continued, the amount of injury done to the Territory, and mining in general, would have been simply beyond calculation. Sharks enough to assist it in its details and perfect the frauds would have co-operated, salting having become a fine art in the Territories; and specialists are to be found in that line whose inventive genius would bring to shame the triumphs of the shrewdest London "picker."

It is very frequently asserted that Utah mines are to-day immeasurably better off than they were two or three years ago. I beg to differ. I consider that the developments, legitimately so called, of a great many Utah mines have not kept measure with the requirements of an open-handed policy, or those of a sagacious management; that mines, instead of being opened and new reserves being laid out, have been robbed; that the timbering and back-filling of a great many have been insecurely done, and consequently will result in sweeping alterations, or in disastrous calamities. Of properties which were flourishing two and a-half years ago, I need only mention the Miller, the Emma, the Flagstaff, the Saturn, the Wellington, and Lexington, the various Tintic mines, the group belonging to the U. M. and S. Company of East Canyon. I need only mention these, I say, to recall to mind an utterly reckless management, or criminal collision with gambling operations.

Of course there are exceptions. Districts whose star has been in the ascendant during the '73 campaign are especially Dry Canyon, Rush Valley; and, to more or less extent, Bingham Canyon. Star district, too, is growing into notoriety; it struggles, however, with a want peculiar to southern Utah, lack of water. This prolific source

of trouble makes itself felt in districts situated even far north, such as in Tintic. A great drawback, and one which will make itself always felt in the best and most advantageously located district of Utah—in the Cottonwoods—is the difficulty of access. The Wasatch and Jordan Valley Railroad, now in course of construction, and intended to tap the mines at Alta, at the very apex of the canyon, will supply this long-felt desideratum. Still persons familiar with the country cannot help feeling apprehensions as to the difficulties of operating the line. Snowstorms peculiar to these mountain gorges are apt to cover the—evidently indispensable—sheds with a burden 2 to 3 ft. high in one night; but what is most to be dreaded are the snow-slides. To anyone conversant with Alpine scenery—and what Englishman is not?—the mere mention of the word is sufficient to convey that feeling of majestic and towering overthrow, and that of utter helplessness, which only these phenomena of nature are capable of inspiring. The mountain scenery in the canyons not being on such a gigantic scale as in the Alps, it is hoped that the limited means at man's command, such as snow-fences, and snow-walls, will be able to avert the danger. The road is now completed to Fairfield flat, two miles above the mouth of the canyon. From Sandy, the point of junction with the Utah Southern Railway, to Granite City, at the mouth of the canyon, it has an average grade of 130 ft. from there to the terminus of 212 ft. per mile. The smallest radius of curvature is 288 ft. At a rough estimate the road has cost, so far, \$4000 per mile for grading and locating; furnished and equipped \$14,000 per ditto. Its continuation to Tanner's, 3½ miles from the present terminus, and situated about mid-way up the canyon, is confidently expected in the course of this summer. The average grade on this section will be 250 ft. per mile; its cost for grading \$4500 per same. On a part of this distance, from Fairfield to Girard flat, 2½ miles, the earthwork has been completed, and is ready for the track and ties. No sheds will be necessary on this division, but about two miles of fences. Above Tanner's the difficulties will begin in earnest. There is no decision yet as to which of the proposed systems, trestlework or continuous sheds, will be adopted; very likely a combination of both. A judicious location of the route, too, will be of vast advantage in evading the snow-slides. Switchbacks will have to be resorted to, as a matter of course; and on these the average grade will be 150, on the main line 250 ft. The length of this Arctic section will be five miles; its cost respectively, unfurnished or equipped, \$6000 or \$16,000. Fences will be in order, of course, all along this section; but it is hoped 1½ mile of sheds and a raised track will be able to cope with all emergencies. Total length of the road from Sandy station to Alta, 18 miles. It is presumed that the freight charges on this road to the junction will be \$2 per ton, a saving on the present prices of 70 to 80 per cent., and of 5-6ths in time. Still the problem of mountain transportation, at least, in some of our canyons, is not an entirely unsolved one.

Wire-tramways, or elevated railways, are being put forward with especial warmth; and though both are objectionable on account of their liability to slides, yet they furnish the advantage of a cheap motive-power. A plan which claims the superiority of long continued success, acquired, I should think, mainly in London for the carrying of mails, parcels, &c., is the pneumatic tube delivery. Comparisons of the respective barometric altitudes at the head and mouth of the canyon would demonstrate, no doubt, the theoretical feasibility, though the wear and tear, friction, &c., incurred, might bring in factors utterly detrimental to the scheme. Three plans here are open to selection:—1. The single tube, as originally used in London. A hydraulic motor stationed at the upper terminus would rarify the air necessary for the return trip.—2. Two tubes, *a*, to contain either a counterpoising weight, or *b*, a second set of cars. In this latter instance, then, the pneumatic principle would be abandoned, though the tube delivery might still be adhered to; it being evident that the mere weight of the full ore-cars will be sufficient to draw up the empty ones, and that consequently the operation will either be continuous, or only that amount of ballast necessary to restore the last equilibrium will be required. The tube system has the advantage among all the devices used in similar instances of presenting the minimum of friction; being buried in the ground, at least for the upper half of the distance, the conveyor would be affected neither by snowfalls, nor any climatic difficulties; the only mechanical device, in the latter instance, being the main pulley; it would require no motive-power, and lubricate itself. The cost of a tube 10 miles long, and sufficiently large to transact all the business required, would not be very heavy, and the plan appears to be well worth being taken up and discussed. It has some indubitable advantages for such localities, at least as the two Cottonwoods are.

A main feature, and one which has never received an adequate consideration at the hands of our mining representatives, is undoubtedly the labour question. Labour supply, *phaw!* I hear exclaim my Utah readers. Yes; labour supply. True, hands are plenty and willing enough to furnish their muscle to the highest bidder; they are only too thankful for the sweeping revolution American money and Gentile enterprise has brought about in their financial status. The Mormons are, almost exclusively, an agricultural people; they never had time yet to learn that the more diversified the industries of a nation the more stable its prosperity. As a rule they have been strictly warned against any other occupation but that of tilling the soil; and their leaders, in stripping them as mercilessly as they do, have shown evidence not only of an utter heartlessness, but of their entire inability to comprehend the truest, the best interests of this people. The tendency of development in this Territory is, as much as anywhere, toward centralisation; without it mining, irrigation, stock-raising, opening of the country by railroads, transmission of power to long distances, are impossible. Capital, large capital, will flow in to bring about the two distinctive classes of modern society—aristocracy and pauperism. In the face of such a future it is doubly criminal to exact the "pound of flesh" from the honestly-toiling farmer and mechanic, to prevent the formation of that *tiers état*, which in all normal communities is the balance-wheel, the mediator of a healthy equilibrium. The Territory is not a self-supporting one; up to within a few years it was regularly devastated by the incursions of grasshoppers, and should this calamity befall us again (which it may at any time), would not our labourers be at the mercy of the foreign grain dealer more than ever, and more than anybody else?

What, at this juncture, the benevolent dispositions of our would-be Solons—now in legislative council assembled—really are, has again leaked out by a little motion brought in a few days ago to *tax* all the ore and bullion produced in this Territory, at rates to be established by the representatives. This, in the face of the money crisis which has depreciated our bullion from 15 to 22 per cent., is in consistency, too, with an appropriation of \$500 recently allowed by the municipality to a Chicago illustrated paper to expatiate on Utah's investments, and in accordance with the "unparalleled inducements for foreign capital" so much harped about by our orthodox papers! Well, if it does not benefit the "heathenish Gentiles," it will most assuredly benefit "our people"—perhaps!

Needless to say that the Bill will not receive the Executive sanction. This motion looks very much like a countershot to make good for the proscriptive legislation evidently in store for Utah. Provided, after such legislation be passed, our U. T. 3 District Court will attend to his own legitimate business—i.e., taking up civil cases in lieu of antiquated religious crusades. No one of our mining community feels especially gratified at the course hitherto pursued, and if the amount of injury done to our mining interests by these *fiat justitia, paret mundus* practitioners be considered, there is enough reason to wish to see them safely landed at the Antipodes. In one single district, in East Canyon, the amount of ore stealing which has been done by "mining jumpers" during the last two years, without any legal redress, is so great as to defy computation. This "trade" flourished principally during, and before, the famous Hawkins (polygamy) trial, when his honour had more to make on political capital than on "paltry mining cases."

Pernicious as the practice is of companies engaging in large accessory enterprises, such as the building of roads, ditches, railways, and extensive reduction works, before having secured the main object—large supplies of good ore; pernicious as this policy is, I say its counterparts are equally detrimental. Very often the agents sent out by large European mining companies to new countries lack that



discrimination, that proper judgment as to economy and expenditure, which is at the root of all success. Instead of judging coolly, disinterestedly, they take counsel from their vanity, rush into all kinds of unwarranted and expensive accessories, and ruin the concern they are connected with. Proofs to this instance are furnished by Mr. D. Roberts, in his correspondence under date Dec. 16, Colorado Territory, to the Journal. On the other hand, I do not consider a close parsimony desirable. The Chicago Silver Mining Company, for instance, successful as it is, labours under the disadvantage of shipping all its bullion to the nearest railway station (Salt Lake City), at a cost of (say) \$9 a ton per team. Now, I would not advise the company to jeopardise its success by the construction of a 40-mile railway on its own account; but there being a company called the Salt Lake, Sevier Valley, and Pioche Railroad, already organised, with the purpose of extending a line from here to Stockton, why cannot the Chicago Silver Mining Company acquire a deal of the stock, so much, at all events, as to assist the railway company very materially? It would be easy to obtain for the shares some security on the property of the road, with the understanding of seeing such mortgage forfeited if the road be not completed within a specified time. The saving on the company's bullion alone would be, for the amount now being shipped, not less than \$60 a day, it being reasonable to assume the cost of freightage a ton of bullion here by steam not over \$2 a ton. Besides, there would be important feeders furnished by the supplies of the Mono Mine and East Canyon generally; the shipments of Carson and Buzzo's smelter, of the Waterman furnaces, and the Jacob's reduction works. The road, besides, has inducements with regard to grade, location, climate, and proximity to the mines such as but few others on the Pacific Coast possess.

Mining agents here have yet to learn, if they have not learned it already, that wisdom does not always come with office. The management of a large company, to be successful, ought to be threefold: the technical and the administrative, both near the location of the works; the financial, at the seat of the company. The more these supervisions can be simplified and concentrated in the head of but one or two persons the better; and it is self-evident, that to make the undertaking successful, each management must be thorough and exhaustive in its respective department. Among the various managers sent out by English companies here at various times some were worthy of the highest praise; but there are not a few whose chief merit consists in selecting their employees and acting wisely on their (the foremen's) suggestions.

Salt Lake City, Jan. 28.

SAM WATCILL.

#### UTAH MINING COMPANY.

Sir,—This unfortunate mismanaged property, upon which upwards of 50,000, has been waste-fully expended, is now under the management of Mr. Longmaid, a gentleman of high reputation, and great skill in mining operations, and who has brought many properties declared worthless into a condition eminently successful and profitable. Our property, as the shareholders now know, is not a silver mine, but an extensive lead mine, containing, it appears, a very large amount of low grade ore of an unprofitable character, but which our present manager has found out the secret of dressing to insure good profits if properly managed by our directors. The ore, although of a low grade, is abundant, and after paying all expenses in Utah of raising and dressing would in this country command from 10¢ to 12¢ per ton in the English market. But as we were informed by our Chairman, Mr. Batters, at one of the meetings held last year, there was a better market in America, where lead could be readily sold 50 per cent. higher than in England, besides saving all expenses of freightage, which was something considerable. At a meeting of shareholders last week this pleasing illusion was dispelled, although we are promised annual dividends of 25,000. An exaggerated estimate of our resources and expenses will explain how these rich dividends are to be provided. This same ore, which was valued from 10¢ to 12¢ per ton, is now represented (without any improvement in quality) to be worth 16¢ per ton; and with those prospects the directors propose to ship 50 tons every month to England for sale, at an expense which they admit of 10¢ per ton freightage, making in all 60,000 per year (money wasted) for transport only. To allow our directors to carry into execution this preposterous scheme would be sheer madness, and would be but to exhaust the mine for the purpose of benefiting shipowners and railway companies, and compel us to provide additional funds to make up the deficiency which would be incurred. We have already lost an immense amount of money over this property through the mismanagement of the directors; I trust, therefore, that the shareholders will be united, and insist upon this most unreasonable and extravagant proposition being abandoned.—Feb. 24.

A LARGE SHAREHOLDER.

#### THE "PACTOLUS AND BABB" GOLD WASHING COMPANY, YUBA COUNTY, CALIFORNIA.

Sir,—My attention has been called to a prospectus recently issued by the above company, wherein subscribers are invited for 2000 mortgage debentures of 50¢ each (payable to bearer), bearing 10 per cent interest, with coupons attached, and redeemable in five years from July 1, 1874, with 10¢ bonus on each debenture. The repayment of the debentures will be secured by a first mortgage on the whole of the property.

It will be seen that the face of this prospectus betrays its very uncertain character, but many may be dazzled by its promises, and as I am familiar with the various claims of the district I will, as a duty to the English public, volunteer the following facts regarding its demerits. Neither of these claims have, so far as I can learn, ever yielded the present proprietors real profits over expenditure.

The Babb claim cannot, I believe, be profitable in the future, because nearly all the ground is said to have been already worked. The Pactolus is small, lies near the "down stream" end of the ancient river bed, that now forms the several larger and richer claims of other companies, and has not hitherto been regarded or proven as a rich property. Although this claim possesses some intrinsic value, too high a price is asked in the prospectus, for if it be even naturally rich I do not think that the value can be realised, as the cost for bringing sufficient water, after the manner proposed, will, I believe, greatly exceed the profits which could be then obtained from the gold of the gravel. The battery alluded to will not be required for working the gravel beds, and is, therefore, useless. If the property has but little value the mortgage thereof will also be an inadequate security.—San Francisco, Feb. 4.

ANGLO-COLUMBIAN.

#### THE "PACTOLUS AND BABB" GOLD WASHING COMPANY.

Sir,—I observe in the *Mining Journal* of Dec. 20 the registration of the Pactolus and Babb Gold Washing Company (Limited), capital 300,000, to acquire and carry on the working of the Pactolus and Babb Mines, near Smartsville, Yuba county, California. Being familiar with the mines in that locality, and believing that the Babb claims were nearly worked out and exhausted some time since, and also being of the opinion that there is less than 5,000,000 cubic yards of pay gravel in the Pactolus and Babb together, and also knowing the estimated product per cubic yard of hydraulic mines in that locality, also being cognizant that the Pactolus and Babb have no water supply available, I am unable to appreciate the process of reasoning whereby these two properties could be valued at the above sum; and I am confident that a thorough examination by a capable, honest expert would not value the two properties at a larger sum than 30,000 sterling, or \$150,000. And the proposition to capitalise these two mines alone for the sum of 300,000, is necessarily a matter for enquiry before being agreed to, and I hope, for the sake of fair honest dealing, that this project may be fully examined into before being completed.

Had the Pactolus and Babb included with them all the principal gold-bearing gravel deposits of the locality, including the famous Blue Gravel and other mines in the locality, constituting about three miles in length, and also including the valuable water supply of the Excelsior Canal Company, all for the sum of 300,000, it would then have been a most desirable proposition for capitalists as a permanent and lucrative investment, as it would undoubtedly pay very large dividends on that amount of capital for a long period of time, as I believe it to be easy of demonstration that the three miles in length of gold-bearing gravel, belonging mostly to the proprietors of the Excelsior Canal, contains over \$15,000,000 in gold, and I have been assured that some experts have estimated it at over \$20,000,000. And the Excelsior Canal Company own, control, and use all the permanent available water supply for all the mines in and near Smartsville; consequently, the same company virtually control most of the principal gravel deposits.

But it would, doubtless, be a difficult acquisition to obtain this property, as the owners have the reputation of being wealthy, and it is generally understood that they have no desire to sell out their gigantic monopoly, from which it is known they derive a large income. I have had occasion several times within the past five years to examine mining properties in this section of country, and, therefore,

write from personal knowledge, as I necessarily became familiar with the whole gold-producing gravel deposits from motives of both professional and of general interest, as the locality is well known by mining experts here as one of good repute, and is often referred to.

San Francisco, Jan. 31.

M. E.

#### EMMA MINE.

Sir,—Mr. Ward, in the *Journal* of Feb. 14, expressed the wish that I should publish the report of my engineering friend in Utah, and I see that he, with the other two commentators upon the "Looker On" of the 14th, does not believe that I sent any mining engineer to Cottonwood at all, or that he saw the mine or gained his information there, or that I have received any cablegram whatever, and as good as asserts that my letter altogether is a grand lie. Their opinion is quite immaterial to me, but, as my letter then stated, I again affirm that I sent a cable to my friend on the date named, and received his reply, as there stated, on the date named; these, as all our cables are in cypher, are, therefore, of no use to anyone save ourselves. I was not at all satisfied with the information given in this first cablegram, as it was so contrary to the reports in the different American newspapers, of which I get two or three weekly, I therefore, on the 4th of this month, again cabled him, and at 1 A.M. on the 10th got his reply.

Mr. Anderson very properly refuses any individual shareholder priority of information, as this would most certainly be utilised for stock-jobbing purposes; he is also very careful as to who he allows to make inspection of the mine, but an old miner who knows his business, and makes use of his opportunities, can gain what my cables requested my friend to do. One person remarked also to the effect that the disinterestedness of my cable was very problematical, and the news very questionable. I should be sorry that anyone could imagine me sufficiently innocent to go to the expense of between 20¢ and 30¢ over two cables, and the other travelling expenses, for no other object than to give the public the advantage of my information. My real aim was and is to reimburse myself for the serious loss which my connection with the Emma and Flagstaff has occasioned me, and now that we have means to obtain truthful information (a very rare article) I make no scruple to go to great expense when this appears likely to be turned to good account. One reason for my delaying this letter is that I had hoped this week to have received a letter from my friend to further explain his cable, but the letter which I got yesterday from him bears date four days prior to my sending off my first cable, and now ten or fourteen days, or more, may elapse before a letter arrives from him upon my last cable; when this arrives I shall be glad to give publicity to his report should I see such requisite. Not wishing to be the object of ironical commiseration on the subject of my letter from my friends, I still style myself

A LOOKER-ON.

#### AUSTRALIAN COAL.

Sir,—In the report of the proceedings of the meeting of the English and Australian Copper Company, which appeared in the *Mining Journal* of last week, their excellent Chairman is reported to have stated, that—

"As to the supply of coal, there was not the slightest fear, but that there was an ample supply to meet any amount of ore that could possibly be obtained without coming to England; an ample supply could be obtained from Newcastle, where their new works were situated. They had large contracts with the Lambton Collieries. The contract for the supply of small coal was for 21 years, at 2s. 6d. per ton; but owing to the large demand springing up, and the advance in price, although they, of course, held on their contract, yet he believed that for some of it they had given 6d. per ton extra, but substantially the contract of 2s. 6d. per ton remained in full force."

Now, instead of "the Lambton Collieries," he should have said, to be quite accurate, and perhaps, therefore, may have said, "New Lambton Colliery." The fact is, that when Lambton Colliery had established a good trade, and their coal had become a favourite fuel in the colonial and foreign markets, certain enterprising individuals took up from the Government some land in its immediate locality, opened a pit there, and called it "New Lambton Colliery." I merely wish to state that I have ascertained that the English and Australian Copper Company's coal contract is with New Lambton Colliery, and not with Lambton Colliery, which, believe me, Sir, according to the view I take of men and things, is quite *une affaire choisie*.

Feb. 23.

A SHAREHOLDER IN LAMBTON COLLIERY.

#### AUSTRALIAN COAL.

Sir,—Can you, or any of your readers, inform me what has become of the Australian and Oriental Coal Company, that was brought out here recently with a capital approaching half-a-million, and proposing to raise a still greater number of coals per annum; and in which, if memory serves me, a director of the Peninsular and Oriental Steam Navigation Company, among other celebrated names, appeared as a director?

The prospectus of it was as warm and glowing as anything I remember to have read, in fact, it almost made my mouth water as I perused it; but I was never very acute in matters bearing on my own interest, and I am not now so quick in my notions as respects such things even as I used to be, and so the list of applications for shares was closed before sending in mine, hence my ignorance. If you can give me the address of the company's office it will equally answer my purpose. Where, oh where, does the Australian and Oriental laddie dwell?

One reason for my troubling you with the question is because I observe that another fresh Anglo-Australian coal adventure is just "out" here, with a capital of 200,000, and only proposing to raise at the rate of 135,000 tons of coal in the twelve months, but bidding high for the favourable regard of "the moneyed man." I notice in the prospectus the price of coal in Australia is put at 14s. per ton, and that the net profits from the sale of coal, *inter alia*, are estimated at 27 per cent. per annum. What a glorious prospect is thus shadowed forth. Australia, as I see by a "case" to which I need not further allude, is rather fertile in invention. Capital, too, is superabundant there, the banks giving very little, if any, interest for money on loan; and the wonder is how the native mind allows such good things to elude its grasp. I suppose it is to be accounted for by the fact that "all fish which comes to net" is apt to find its way to London, both good and bad. I imagine it must be a sort of magnetic influence that draws them hither. Be that as it may, it occurs to me that the price of best coal in Australia was not long since 7s. per ton; and as the margin between 14s. and 7s. is wide, it might make a considerable difference in the prospects of the business. Solomon, too, tells us that "there is nothing new under the sun, so that what is shall be again." However, his moralisings seem to be considered too antiquated for the present dispensation.

Only the other day my attention was arrested by the appearance on the scene of another fresh native Australian coal adventure, to wit—the Newcastle Coal Mining Company, started to work, on a royalty, a part of the Burwood property, near that port, and which belongs, as I understand, to the manager of the Australian Agricultural Company. It is true the name it has adopted is very "ominous," looking back a little, still this Antipodean has got the start of his London coadjutor by a long way. And am I wrong in putting the number of coal companies working in Australia at more than twenty? I think not. But "the more the merrier" appears to be the motto of the age we live in; the worst of it is, however, that so much champagne and good cheer over night is apt to produce the sensation of headache—I had almost said heartache—in the morning.

You will, no doubt, wonder at my ignorance in not knowing all that is to be known about the Australian and Oriental Coal Company, and I only console myself by the hypothetical reflection that "if ignorance is bliss 'tis folly to be wise."

Feb. 24.

ENQUIRER.

#### AUSTRALIAN COAL.

Sir,—The postman's knock at my door to-day brought me a circular from a firm of brokers in the City, giving me, as a shareholder in the Peninsular and Oriental Steam Navigation Company, a pressing invitation to take shares in the New South Wales Collieries Company (capital 200,000), in which two of the directors of the former company re-appear in the same distinguished capacity. These kind and considerate brokers inform me that "It has for some time past been known that large and valuable coal fields exist in New South Wales," and that the establishment of this collieries company, in which they

cordially recommend me to take shares, "Must prove of great benefit to the Peninsular and Oriental Company." Well, it should perhaps be cheering to be told so! It does not escape my recollection, however, that one of these two directors of the Peninsular and Oriental Company figured as a director in the notorious Australian and Oriental Coal Company (capital 300,000), that was not long since projected here to take over the Minnie and New Lambton Collieries (one of which was at the time not only not working, but full of water), and raise 450,000 tons of coal a year, but is not raising any, for the very sufficient reason that it could not be got to float.

For my part, I have for some time fancied the P. and O. Co., with its meagre profits and comparatively low dividends, rather a slow coach, and I was beginning to settle down in the conviction that, unless some explosion or catastrophe should occur to disturb the monotony of its management, it was likely to continue slow; but if I could persuade myself that all I am told in this disinterested circular be gospel I ought, perhaps, to begin to have hopes of its increasing its speed a little. Hitherto, I think, the P. and O. Co. have obtained all its Australian coal from the prosperous Australian Agricultural Company, and, as the agent at Sydney and some of the directors were common to both those companies, the trade in coal between them cannot have been very difficult to arrange, and it may be presumed has been conducted to the mutual advantage of their shareholders. At the same time, it has been regarded in some quarters, I believe, as partaking rather much of a sort of family arrangement, the said agent, it is said, earning and deservingly receiving, the usual commission as buyer and seller from each company. But now it seems from the circular that the P. and O. Co. are about to share their purchases of Australian coal between the A. A. Co. and this projected New South Wales Collieries Company. A little wholesome competition, it may be hoped, may intervene to the benefit of the P. and O. Co., unless, indeed, this New South Wales Colliery Company should "go the way" of the lapsed Australian and Oriental Coal Company, or these two coal-producers should adopt the "co-operative" principle.—Feb. 25.

AN INVESTOR.

#### COAL A DANGEROUS CARGO—No. VII.

Sir,—After describing the various mechanical means that have been proposed with a view to counteract the dangers attending the carrying of coal in ships' bottoms, and examining their respective merits and demerits, I now proceed to the elucidation of the chemical methods which have or may be proposed, or may be deserving of a trial.

I know of but one chemical substance that has as yet been proposed against spontaneous combustion, and that is carbonic acid. Combustion and explosion being facilitated or produced by the accession of air *versus* oxygen, it was rightly thought that a body which itself is not combustible, and which does not support combustion, would be most conducive to the prevention of both causes of accidents. Still the use of carbonic acid for this purpose has never been submitted to the crucial test of a regular trial, but I may venture to say, theoretically speaking, that if it had been tried it would, in all probability, have proved a signal success. About the practicability of its use, however, I am not so certain. Carbonic acid may be got easily in nature, and is found combined with many other chemical bodies, which may be easily separated from it. But to produce large quantities of it cheap, quick, and without much trouble on board ship is, I believe, altogether out of question. I do not think that a lime kiln, a coke furnace, or a gasogen can be easily established on board. There would practically be but one way of using carbonic acid on board ship, which is to take the acid on board in a liquid state, and empty one or more bottles on the smouldering fire or the gas-producing coal. However, the expenses in this case would, I think, militate against the direct use of the acid, and some other compound must be found, cheaper, easier of production, and without possessed of the same qualities.

It is a long time since it was found out that in the case of a chimney fire the simplest and readiest means of extinguishing it was to throw a handful of sulphur over the fire, and put a damp cloth over in front of the chimney in order to shut the air out. This result is very easily accounted for. When sulphur is burnt in presence of air *versus* oxygen it takes up two equivalents of oxygen, and becomes sulphurous acid, which, being possessed of great attraction for another equivalent of oxygen, takes that gas whenever and wherever it can meet with it. It is, therefore, by no means difficult to understand why, in the case of a chimney on fire, the burning of sulphur is sufficient to put the fire out. The sulphurous acid produced absorbs all the oxygen of the air contained in the chimney, and leaves none for the further combustion of the soot behind.

The same phenomenon must occur when sulphurous acid gas is put into contact with an ignited material under the same circumstances. It may, therefore, be taken for granted that sulphurous acid gas practically possesses the power of putting out any fire that may arise in the hold of a ship, whether from spontaneous combustion or from any other cause.

From the peculiar properties of sulphurous acid gas it may be inferred that the same has also the power of preventing explosions from gas. I observed in a previous letter that an explosion may be brought about when 1 part per volume of carburetted hydrogen is diluted with more than 4 volumes or less than 16 volumes of air. If instead of air the explosive gas has sulphurous acid gas mixed with it, the necessary conditions for an explosion will have ceased to exist. Of course, it remains yet to be seen whether it is practicable to use sulphurous acid gas on board ship, but I should say that it would be well worth while to try it.

I may add that sulphurous acid gas is very easily produced, a small furnace and an iron pipe alone being wanted under ordinary conditions, and 1 ton of sulphur burnt in such a furnace would give more than 70,000 cubic feet of gaseous sulphurous acid, therefore the cost of the requisite apparatus and material would not amount to very much.

It may be objected that the inhalation of this gas is noxious, offensive, and injurious, but this drawback can easily be steered clear by the use of paste, made with water and peroxide of manganese, put on the leakage where human beings are staying, or the hatchways, if necessary, where the gas is at work.

Considering the number of lives and the great amount of valuable property destroyed year after year through the effects of spontaneous combustion, or explosion of gas on board ship; considering, also, that all the remedies hitherto devised and tried have, on the whole, been found wanting, I beg leave to urge upon the public at large, and upon shipowners in particular, that whatever means there may be of preventing these disasters, wholly or partly, ought to be seriously tried, and it will be found in the end that by the judicious outlay of a comparatively small sum of money for an experiment made on a large scale the shipowner who causes the trial to be made in the first place, and subsequently the coal shipping interest at large, will be enormously benefited; and, what is much more important in the eyes of the philanthropist, the lives of thousands of our fellow-beings now constantly in jeopardy will thenceforth be secured from the pernicious effects of spontaneous combustion of coal carried on board ship.

7, Carlton-square, New Cross, Feb. 25.

A. VASSARD.

#### ON OPENING MINES FROM SURFACE.

Sir,—Your correspondent, "R. S.," in the Supplement of the *Journal* of Jan. 17, seems to persist in having perpendicular shafts for both engine and whim, pumping and hoisting, on the grounds that lodes are not straight enough in their declivity. He also holds out that cross-cuts should be put out from the perpendicular shaft to cut the lode at every 10 fms. He speaks of a shaft on a lode in one place perpendicular, then dipping northward, and then southward, and to confirm that perpendicular shafts are preferable, he says, "the intelligent managers of the central of Cornwall adopt them in most cases." In such a lode as "R. S." speaks of, in one place perpendicular, then underlie northward, and again southward, it might be held as an exception in this rule in question, as I allowed there are exceptions in most rules; but so far as I have seen lodes, their underlie in most cases throws but little difficulty in the way of pumps and rods. This often is the case. Lodes make slight turns in their underlie; but the shafts in sinking are easily made straight by a few holes blasted either in the foot or hanging-wall, as the case may be, and thereby enable both pumps and rods to be brought down in a proper direction. Even should those turns in the angles of lodes require considerable labour to straighten them, I do not see how it should be more so from surface to the bottom of the perpendicular than below that point. Should a shaft be sunk 80 or 100 fms. perpendicular, as "R. S." names, and then strike the lode, he would certainly advocate the further sinking to follow the lode.

I, therefore, look upon the objection "R. S." has to diagonal shafts, taking the whole matter into consideration, as of little or no ac-



count, more particularly as he says because such shafts have been sunk they must for ever be so. He might as well argue that kibble for hoisting should be continued instead of incline railroads.

Your correspondent, "A Miner," on the same subject, seems to hold a sensible view that the matter should be weighed as being worthy of consideration. He further says he shall be prepared to give example, &c., which I shall be pleased to hear, and I am well sure mining companies ought to be, as they are the sufferers where there is any extra expense. Allow me to name an instance on hoisting in a diagonal shaft compared with those of downright half-way and their diagonals. In this mine we have the diagonal with a railroad car. The car alone weighs over 1½ ton, and takes up 2 tons of rock. We hoist a car from the 100 fm. level, empty it without anyone at the surface as lander, and let it down again to the same level in two and a-half minutes upon 35 lbs. of steam-pressure. Now, Sir, can you show me where there is a kibble or kibles that will accomplish that work in the same time, and upon the same amount of steam-pressure through one of those half downright shaft. This is only one point of three questions as to which shaft is best. I contend the diagonal from surface is superior for hoisting, also for pumping, while we all know it is by far the most desirable for showing up the lode.

While speaking of perpendicular shafts and cross-cuts, allow me to call your attention a moment to a cross-cut driven in a mine in Wales lately, over 100 fms. to cut, if I mistake not, the Roman Gravel lodes, but abandoned before reaching said lodes, although said to be only a few feet more to drive. This cross-cut, I believe, is only about two levels from surface. Now, what man calling himself a miner would even think of such an extravagant, thoughtless piece of work. The idea of a cross-cut such a distance. Why not have spent that money in the lode, which would have told them what the lode would do for them, and also how to further open it? But as it is, I am under the impression they do not know when the lode is at surface, or that they induced a party to organise a company upon the strength that the Roman Gravel lode is in such a set. While such is not the case, such courses taken are ruinous to all mining enterprises.—*Lake Superior, Feb. 8.* A MINER.

#### MR. ENNOR ON MINE REPORTS.

SIR,—Noticing the depressed state of the metallic mines, not one in two counties more than paying interest on the money, and only three or four of them doing that, causes me to look around and pause awhile. I ask how does this happen? Then I discover that I have surveyed more mines than any other man in England, and I started with the supposition that there are but two good mines out of twenty worked, and I never report more than that number as being likely to pay. On reference, and from recollection, I find I have somewhat overdone it: only fifteen out of twenty should have been worked, and not over three of them would ever have paid. Reporting on mines is a thing which requires a deal of consideration, even should the mines be situated in a well-known mineral district.

The production of ore is dependent on the bearing of the lode to the strata, and its intersections by cross lodes and elvans. These cause great chemical actions to take place. No large bodies of ore are formed without them. They leave their own visible signs to prove it. Single and lineal lodes may produce "stocking" ores, but seldom sufficient to pay. They but seldom show signs of a great chemical action ever having taken place. Under these circumstances the mine inspector has to look carefully around, and discover what visible sign his lode shows, and what intersections he has in his mine. In his reports he should fairly show every good point in the mine, that they may be criticised by everyone who studies the subject. It will open the eyes of the shareholders, he discarding from his reports that "the strata are mineralised," if he cannot tell with what. Such vague reports only draw on the shareholders to pay calls during twenty years, and not two mines in twenty ever paying back a single shilling.

I said before that I have generally condemned eighteen out of twenty call-paying mines, and I do not regret having done so. I can now look around and see masses of mines at work that I condemned twenty years since. I intend to notice generally the reports that are printed and ask questions on them; not that I condemn them, they may have good points, but I shall require answers as to when they are likely to become paying mines. I ever contend that all agents are bound to report all good points they have in the mine correctly. It is a guide for the holder, as well as for those inclined to purchase. It will establish mining on a better foundation, and make it a surer investment.

To commence, I will begin with PENSTRUTHAL. A large amount of money appears to be called up for this mine, and shares are now quoted as rising in the market. I may ask on what grounds, having surveyed the mine? It is only fair that the agents should report as to what they intend to do with the large amount called up. Are they about to re-open the old mine? If so, on what grounds? Let them show all the good points, and the amount required to lay them open. I am alluding to the amount of money that should be spent on the mine, not money to be shared amongst promoters or committeemen. If they are not going to open the old mine are they going to open side lodes, and if so how many have they? What distance are they apart, what intersections will they cause with each other, and with what bearing? What cross lodes have they, and their bearing? I have long discovered that these are points which should be watched and reported upon in a mine; they have a deal to do with the formation of the ore. Then show what elvans they have, and their bearings. Then show the public what they propose to do, and their estimate as to cost, and what pumping power is required. If my recollection serves me, I think every lode in the sett is cut, or may be cut, from an adit 40 or 50 fms. deep. This, I say, is quite deep enough to convince any sound practical if the mine will ever pay. A company advancing such capital, and those inclined to purchase, have a right to ask these questions, and their agents are bound to answer them, and show all their good points. They are paid for giving such information. It is a credit to them to show the mine is a good speculation, and a genuine one to work.

I next call attention to TRELEIGH. I heard a good deal of high reports on this mine two years since. These agents are bound to show such reports to keep it swimming, and will surely show the public all its good points, and about what it would cost to bring it into the Dividend List. This would show the real value of the sett, and encourage the holders.

EAST LOVELL has not met expectations. It is shown to have had some excellent deposits of tin. Then I ask what number of lodes has it, and what intersections they have? What cross lodes and what elvans? Do the elvans (if any) intersect the lode? Were does the tin chiefly make? Is it in more than one lode, or at any particular intersection? What length is the deposit of tin? Is the tin produced about a slide or not? Show all the good points, and it is not unlikely it will enhance the value of the mine, and particularly so if they can guarantee it will shortly be prominent in the Dividend List.

WHEAL CREBOR.—I worked in this mine when it was in its better days. Reports now run high as to the value of the eastern ground. I am not aware of what intersections they have in this new ground. I notice that the mine is barely meeting expectations. Were the agents to show all its good points it would encourage the shareholders, and cause many more to purchase in it. It may have many good points, not sufficiently shown up.

GUNNISLAKE (Clitters).—I think I condemned this mine 15 or 18 years since. It is producing copper in granite; but copper is out of place in granite, it only makes copper about intersections. They soften the granite, and at times cause good deposits of copper to form, but seldom enough to pay. South Caradon, in granite, may be instanced as a paying mine, but its copper was under the overlap of killas, and it has many lodes and cross lodes running near together, that soften the upper granite. As the granite hardens in depth copper will die out. I say to the "Clitters" Company, follow the ore so long as it will pay, not after.

HOLMBUSH.—I notice that this mine is reported on as to be again opened and worked for arsenic. This is the first experiment I ever knew of an old deep mine to be opened for arsenic. This mine

never paid for working as a copper mine, even when shallow. It will be a move in the right direction if it is worked for arsenic, and pays its way. The party, be whom they may, who are about to try the experiment I wish success to. Will they kindly show the public their estimate of cost to work the mine, and what quantity of the arsenic they calculate to raise per month, its value per ton, and from what portion of the mine they expect to obtain that quantity, and if they calculate on paying a dividend or not. These things should be clearly shown, as there is a wide field open for the working of arsenic mines, provided that they can be made to pay.

*Robin Hood Hotel, High Holborn, Feb. 24.*

N. ENNOR.

#### "LIME FORMATIONS"—MINING EDUCATION.

ANSWER TO MR. ENNOR.

SIR,—Mr. Ennor is like the Irishman who resolved that somebody should tread on the tail of his coat, and has picked me out especially to do it, so that I am obliged in all politeness to give an answer. He might, however, have started correctly, because I said "It is quite clear from the report of Mr. Bredemeyer, as shown by his plan and sections, of which I select the following—Section No. 3 and Section No. 2." I only referred to one mine (the Camp Floyd), and I did not call the sections plans. The sections are rough copies of Mr. Bredemeyer's, but they are correct in showing the lode stratified between the lime strata. I gave the information and the authority for it, and do not claim the knowledge as my own. Professor Clayton has written an able article, with section, on this same lime formation at Camp Floyd, in the *Utah Mining Gazette* of Dec. 27, which confirms Mr. Bredemeyer's opinion or plans, and I fancy our *Mining Journal* would sometimes be more interesting if it had such articles, instead of the personalities contained in "Miners' Conversations," in which I agree with Mr. Ennor.

I have found the lime formations quite different from Mr. Ennor, and certainly not treacherous. The large shipments of silver ore sent to England since 1851 came principally from the lime formations in the North of Chili, all assaying very high, and the Swansea and Liverpool smelters can confirm it. Latterly the Caracoles Mines are the richest, producing more ores than they can find purchasers or smelters for, either in England or Germany. Previously the Potosi Mines, and the Cerro del Pasco, in Peru. The formation of the limestone strata in Chanarcillo, Chili, has been given before in the *Journal*. The lodes go down steadily at an angle of about 25°, and have not been unbottomed by shale. Vertical shafts of over 400 yards have been sunk there. Hundreds of Cornishmen have worked there, and know the underlie is so steady. Lime is the best matrix, and produces the richest silver ores. In the great Rosario Mine, of Mexico, it is well known that before the great bonanza of mineral a bonanza of lime was found. On the outside of Chanarcillo hill the limestone looks like stairs or steps, but in the hill it becomes very compact, and so Capt. Sampson Waters having found, after contracting and sinking a shaft some depth in the Dolores Mine, at last gave it up, as the ground got so hard. No shales were found.

As regards the depth of the lime rock, Prof. Clayton calculates it at Camp Floyd at 1000 to 1200 ft. between the lower and upper beds of quartzite; that corallines and mollusks are occasionally met with, but too much changed by crystallisation to admit of an accurate description; that the shaly limestones are rich in Devonian and carboniferous types. My idea of the formation of lodes is that that they were formed on the cooling of the heated masses of rock, and by earthquakes. I suppose the ore was formed in the lodes, and came up with the rock formation; and, as to the time of the rock formation, it is more likely to be calculated by centuries than years, and I doubt anyone answering Mr. Ennor that question correctly. The fossils found in lodes lived under water, and fell into the fissures, and the lodes were, probably, under water at that time. I suppose the ore was formed by aqueous agency, or the percolation from the strata into the fissure, and by electricity; and that the dislocations, faults, and cross-courses were formed by the last upheavals. In some countries, where it never rains, like the north of Chili and Bolivia, there has been apparently no post-diluvial rain to cause aqueous formation of mineral, but where it rains I think that ore is still being formed by water, electricity, and gases. In the countries just mentioned probably now only by electricity and gases. I remember two men being killed in one of the Chanarcillo mines by the gases which escaped after firing the shots which discovered the arsenical silver ores found there in depth after leaving the surface chlorides. I must here mention that Prof. Clayton considers the Camp Floyd district somewhat anomalous in character, and worthy of close examination.

Geology is young as a science yet. All strata may be of the same period all over the world, but there are varieties in their compositions which account for the varieties of ore. I have stated there is a distinct relation between the stratum and the mineral found in it, so much so that a few years since I wrote in the *Journal* that certain strata produce certain minerals, and inversely some strata will not produce certain minerals. I cannot suppose that metals could have been ejected from the heated centre of the globe, the distance being one difficulty, in order to account for finding copper on the surface and tin in depth, in Cornwall, if it were not accompanied or caused by a change in strata. One of the remarkable things I should like to see is the Harmony and Montague Mine, if as stated, a copper and a tin lode run parallel side by side. It is the junction of two kinds of strata. The limestone at the celebrated Emma Mine, of which I have a cross-section, is of little depth, some 300 ft. I should judge, as the lode had a heave, and been found since in the granite, 13 feet in width, and rich ore auguring most favourably for future success. In fact, I think the mine will cause more sensation yet at its richness, and believe they are just on the top of a new bonanza, which will be more lasting, being in the heart of the hill in the firmer granite. Perhaps the distracted shareholders might send us to report on their mine. It would be quite a nice geological trip for us, and pay our expenses in these hard times; you would be the mentor and have a willing pupil. The question of the Emma Mine is one of the most important practical mining subjects of the day, since the enormous amount of the purchase money swamped all chance of a fair dividend on the shares, causing the present decadence and distrust in mining; and until the mine gives or promises another bonanza we cannot expect a favourable reaction, in view also of the price of tin, copper, and lead.

Mr. Ennor, on the one hand, bullies the Cornishmen for their ignorance, and ridicules the Mining School on the other. He tells the first that they should find the run, dip, junctions, and costean well before commencing operations, sinking shafts, or erecting engines. All very well, but I give them credit for knowing all that already, but it is not always that captains can carry out their ideas. The lords should pay all these preliminary expenses to induce adventurers to explore and increase the value of their properties. Perhaps Mr. Ennor expects the miners to study books while they are resting, like Elihu Burritt, or while the smoke clears away after a shot. The Cornish miner asks for a fair day's pay for a fair day's work. He does not go on strikes, knowing the adventurers cannot regulate the price of copper and tin, but goes abroad in bad times to every country in the world, does well for himself, and credit to the Old Country. I only wish I may work always with such men, as a rule saving, sober, and industrious. Compare them with the coal miner, especially the North British, who want to work three or four days and get six days' pay. The mass of working people are the sufferers of the long, cold, wretched winters of this country from the high price of coal, and our manufacturers will next feel it, and surely there must be a reaction before two years more. Let them use the money they subscribe as a lottery, that those who draw the numbers can emigrate—say 1000, for each man, and 500, for each of his family, or in proportion, and so create a demand for the labour of the remainder.

As regards the Mining School, it certainly might assist us, as Mr. Ennor says, by making investigations, analysing the different strata, giving us geological plans, sections, and articles on our different mining districts. Mr. Warrington Smyth's lectures show an immense amount of research, and of practical and scientific knowledge. What is required is to combine the practical Cornish knowledge with that of the Mining School, and to give the M.E. degree for it, and the possessor of it would soon acquire a position to repay his time and out-

lay. I have little doubt it would give a better return than the Cambridge and Oxford B.A. degree, as a rule. It is a subject for the Government of a country of such great mineral wealth, and I believe the same may be said of the civil engineer; the two subjects could form the nucleus for one Government college. A great change has come in these matters in mining, because 20 years ago very few speculated in mines, whereas latterly it has become recognised as a legitimate industry, and although now under a cloud it is requisite to raise the education and position of those engaged, especially in the management of large capital and important works. Anyone can place M.E. after his name now, but it carries no recognised value. The lords take very little interest so long as they get their dues, most unjustly on the produce instead of the profits, but the time will come when they will be forced by Spanish iron and lead, by Australian tin and Chilean copper, to change their views. British mines cannot stand lords' dues, heavy promotion, merchants' profits, local abuses and the higher wages to meet greater cost of living necessary to keep the Cornish miner at home. About emigration, I should like to see the Government meeting the colonies half-way in their endeavours and outlay; I believe it would pay the country. Look at the rise and progress of Australian commerce and mining with such a small population, and yet such large consumers of our home manufactures. It is useless to talk of education of the masses when the crime is due to absolute want and misery, as shown by the 100,000 paupers in London alone. Send emigrants to our colonies, and you change them from producers into consumers of our manufactures, and it will lessen crime, misery, and suffering among the masses of the people, and it will pay for itself in the long run; besides, you must fill their stomachs before you can fill their heads. When one thinks of the millions of acres lying idle in Australia it seems hard some plan cannot be devised to utilise them for the benefit of ourselves and our colonies. I believe the masses only require to have the question explained to them to take advantage of it. The Conservatives refer with justice to the loss of sovereignty over those acres, which could have provided for every soldier a homestead on retirement.

Mr. Ennor says "there is nothing new under the sun," but I am not surprised at some discovery every day. Perhaps emigration is going to be the great special feature of the latter part of our century. Proverbs are very well in their way, as "a rolling stone gathers no moss"; but I find it gathers some very hard knocks, and let us hope, some experience.

JOHN P. SEWELL.

P.S.—I am waiting, like others, for the book Mr. Ennor is writing.

#### MINERS' PAY—FIVE-WEEKS SYSTEM.

SIR,—From your several correspondents in last week's *Journal* this question still appears to cause a diversity of opinion as to the desirability of having the lunar or calendar months, kindly allow me to give my views on the subject. In my opinion the introduction of the lunar months tends to mystify the accounts. I like to see the calendar month, say, "January," with all bills charged and endorsed "January," with amount stated and endorsed paid. If the mine meetings are held three-monthly, say, January, February, and March, let all bills be charged to end of March, and the audit or meeting held as soon after as convenient, and, if necessary, appoint a responsible auditor, whose name should be a guarantee of the accounts being correct. In my opinion, there is no question but that it should be calendar months; but so far as I have read the correspondence in your valuable *Journal*, no one gives the right version why such alteration took place. It occurs to me that the true reason of the change is owing to the manner of making out the monthly cost-sheet; surely a tributor or tutwork man ought to earn more money in five weeks than in four.

I am myself agent for a private company, and adopt the calendar month. Next month being "five weeks," I charge agency, 1½ month; smith, 1½ month; carpenter, 1½ month; tutwork as per contract, and keeping a stem book. Labourers per stem, if full time, it will be 30 stems. Paying subsist the "second" week in each month, and in the five-week month extra subsist, so that in my opinion the only objection that any miner can have to return to the calendar month is that they would lose one "Maze Monday," of which not one in 500 would think of. I have no difficulty to get good miners, and in my opinion if the monthly cost-sheet was made out as I have stated there would not be any difficulty or objection for one and all to again adopt the five-week system.

SIMON.

Feb. 24.

#### MINERS' PAY—THE FIVE-WEEKS SYSTEM.

SIR,—The references which have been already made in the *Journal* respecting the mode of Cornish pay I hope will lead to the entire abandonment of the thirteen pays in the year, and the proper adoption of the original mode of pay re-established. Shareholders were never consulted about the change, and were unacquainted with the facts as to the introduction of the innovation, which it has been justly termed. Moreover, why was it allowed to be adopted without their consent? Surely shareholders have a right to a voice in a vital change of accounts affecting their interest, which are now so complex that they cannot comprehend the existing method.

Confidence should not be shaken by an undefined termination of accounts, and I, for one, will make it a special point of enquiry to have nothing whatever to do with any adventure where there are thirteen pays in the year, and where the accounts are not brought up to a fixed calendar monthly period, as heretofore. Many investors are fogged by the present mode of rendering the accounts, and I hope that this system, which is now being exposed to the public, will not be allowed to rest until it has been abandoned. I am very glad this question has been raised, and trust that mining shareholders will combine for its abandonment to strengthen, if it should prove to be necessary, the hands of directors and committees. These gentlemen have only to give positive instructions for the bargain settings to be made as formerly, and the time people's pay compounded into twelve, which has been suggested for a friendly settlement of this unsatisfactory pay business.

Lee, Feb. 24.

AN OLD INVESTOR IN CORNISH MINES.

#### MINERS' PAY—THE FIVE-WEEKS SYSTEM.

SIR,—The subject of miners' pay I find is attracting general attention, and perhaps it would not be amiss while the matter is under discussion to throw out some ideas which do not appear to have occurred to any of your correspondents hitherto. We know that every effect must have a cause, and when we see mining in such a state of depression as at the present the business man will not be satisfied with bemoaning the fact, but will seek for the cause, in order that he may provide himself with a remedy. One of the causes is not far to seek; it lies in the belief, rightly or wrongly entertained by a large class of mining investors, that the smallest proposed change which has the least semblance of benefitting the employer will be immediately followed by a "strike," unless the "obnoxious" cause is removed. Now this is not as it should be, and not as it would be if there was a little more of the give-and-take policy. Take, for instance, this simple matter of pay, in which none would be losers, and probably some would be gainers, at least in convenience, how is it that the proper system is not adopted? Is it that there is any fear that the men will oppose it, and that the masters having committed themselves to the re-introduction of the 12 calendar monthly pays could not withdraw from the contest without some sacrifice of influence, or without giving another blow to mining? It is these unnecessary obstructions and restrictions which render the means to conduct mining operations so difficult.

If the miners only saw their true interest, anything which inspired confidence would receive a ready acquiescence from them, and surely there was never a time when confidence was so much required as now, when, without some effort is made both by companies and men, we are in danger of losing greatly by the competition of other countries. There is no doubt that the derangement which has resulted from 13 pays in a year is very considerable, and it seems to be almost an impossibility to either make up accounts or understand them with any degree of accuracy, and for an intending investor the accounts are everything if he be a prudent man, for he is not likely to invest if there is a sure prospect of loss, and on the other hand



he is deterred from purchasing into *bona fide* and profitable concerns for a like reason. That something should be done, and quickly, to restore mining to its legitimate position is certain, if we do not wish it to slip entirely away from us; and to begin at the right end is, of course, not only a desideratum but a necessity. What, then, can be more reasonable than to remove the first and greatest stumbling block in the path of the investor? WELL-WISHER.

London.

#### MINERS' PAY—THE FIVE-WEEKS SYSTEM.

SIR,—As one largely interested in the mines of Devon and Cornwall, I am much pleased to see the movement now taking place to recur to the old arrangement of paying the men, and making up the cost-sheet by the calendar month, instead of as now by the lunar month, as I have not only found it most inconvenient personally in having to attend the meetings from such a distance, but think that the sampling and sale of ores is much more readily carried out by the old system of 12 months payments in lieu of 13, and I can only say that the movement has my entire and hearty concurrence.

Bickenhill, Feb. 24.

J. ROWLANDS.

#### MINERS' PAY—THE FIVE-WEEKS SYSTEM.

SIR,—I observe from various correspondents to your valuable Journal that the miners pay of four weeks is very disagreeable to the shareholders generally. I have reason to believe that the miners of Devon and Cornwall would, to benefit the shareholders, prefer to have only four pay days in one year for all tribute and piece work men, but to have money when required, all day work to be paid every week or fortnightly, with but three days kept in hand. I see one correspondent says the Cornishmen do not perform that amount of work when at home they have to do when they go in other districts, but before throwing dirt in their face by insinuating they are lazy, bait them home with the bait they are baited with when in other districts—short pay, and a price for their work. You would then find very soon whether the Cornishmen were to be left behind or not, they do not require the mazed Mondays so much said about. There is no doubt a change is required under the present state of things, materials being high and minerals low, but begin in the right direction. I never saw a carrier get rich by working his horse without corn—our mines now are being chiefly worked under the Limited Liability Act, then why not pay the miner and the merchant as promptly as they would be paid in any other undertaking?

Capt. Teague and others have been speaking in strong language to abolish the Stannaries Court, but if men and merchants were kept paid close the Stannaries Court would soon become obsolete, and reckoned as one of the past.

Callington, Feb. 25.

J. BUCKINGHAM.

#### PRINCE OF WALES MINE.

SIR,—During the past week my attention has been called to a letter in a contemporary of Jan. 31, signed "G.," in which much is said about my mismanagement of the Prince of Wales Mine, and the loss that has been made during the last four months, although "G." very carefully omitted saying that to show that loss there were five months' cost brought up against four months' returns. From the tenor of his remarks I am led to think "G." believes in the old proverb, that by "throwing much dirt some will stick;" and as I do not care to notice further anonymous letters, I beg to say that being a shareholder in the mine, I shall, if possible, attend the next general meeting, and shall then be prepared to render an account of my stewardship.—Redmoor Mine, Callington. J. GIFFORD.

#### MELLANEAR MINE, HAYLE.

SIR,—Although never directly interested in this mine as a shareholder, yet I have always felt a deep interest in the welfare of the concern, and no one in the district in my position could have felt more pleased than myself when it became known some time ago that a discovery had been made in the mine. We all are aware that, owing to the state of things in this our day, the system of conducting mining operations should receive special, and more than ordinary, attention; the most economical and easy means in all branches must be employed in rendering the returns marketable, or the richest mine must quickly fail to exist. In writing a few words respecting this mine, I must first acknowledge that I am quite unacquainted with exact measurements and distances, although I have a thorough knowledge of the surface and district; but I know from reports I have seen from time to time, and more particularly from the information afforded by some of the most intelligent miners that have worked there, that a very good bunch of copper ore has been met with at different levels between the two engine shafts. Unfortunately, however, the discovery was only reached at the eleventh hour, or at a time when the capital of the old company got near exhausted; indeed, in their struggle to render the mine a more convenient one, as was supposed, in the shape of sinking a new engine shaft, erecting a large engine, and putting up steam-whim, &c., together with the unusual amount of expense in keeping the mine free of water, resulted ultimately in a suspension of operations; at any rate, so far as producing mineral is concerned. From what I have seen and heard, however, I am pleased to think that ere long this concern will again be vigorously developed. I am glad that the dry season is now soon on us, when the work of draining the mine may be accomplished in a comparatively short time, and for a moderate sum, provided the machinery performs the work expected of it; past proceedings in the main and spirited way they have been carried on under the circumstances call forth the admiration of everyone, and it is the feeling of the people in the neighbourhood that success should attend the future prosecution of this important mine.

My chief object in troubling you on this occasion is to invite attention to the future mode of management: in plain language, I must say that I cannot agree with the system apparently intended—to command the entire workings with the present shafts. This is not only my opinion, but other mining authorities in the district concur with it. If the ore contained a large share of copper, and if it were ascertained that any amount of mineral existed there, and known to dip west, as is generally supposed, then the new engine shaft might be expected to be sufficient after a time, but the nature of the ore or lode at the lower levels, with the many extra expenses connected with the working of this concern, will not warrant such big manner of working, and I say, unhesitatingly, that unless a new shaft is put down in the heart of the deposit of ore the future development can only result in further loss to the company. It is known that such a shaft would have paid for itself handsomely long before this, if only started at the time the mineral was met with, and the present state of things is only due to this mismanagement or oversight. Such a shaft could be carried down on the lode from near the surface, thus proving it; and rising against it might also be attended to at the same time. In this way a large amount of work could be dispatched quickly, and the mine profitably carried on.

Never was there a mine worked and mineral excavated at a greater disadvantage than here. A lack of ventilation alone proved most ruinous. Much of the time the men could not work at all, and at other times partially so, thus costing immensely beyond the natural rate. Now the engine shaft is down a good depth, I must advise sending away a level at about the deepest point, and let it be so done that a flat rod might work in it, and brought to bear on the shaft. I would sink on the ore below this level. From said level to the surface the ordinary size whimshaft would be sufficient; the great failure in future will be the new engine shaft, so far away from the ore ground. Any miner of understanding might see at a glance the difference in wasting time and money in digging away down in the country at a distance from the main object, or going down on the mineral itself. In the latter case the moment the stump is down away goes the ends into the ore, while the former is a most expensive and tiresome manner of doing it. Indeed, the one means profit, the other loss. It might be said that the bunch of ore at this mine will ultimately dip away under the present shaft, thus rendering a new shaft unnecessary. But I do not think it reasonable that anyone should form such an opinion; if so, what is there to guide them?

Alfred Consols, on the same lode, was found rich up and down against the cross lode, and never seen to dip away from it to any distance. The great bunch of mineral on the same lode, in Great Wheal Alfred Mines, did dip away rapidly to the westward, but in this case it only followed the junction of elvan and date. In Mellanear there is nothing of the latter kind, but there is a cross lode similar to that at Alfred Consols. Then, I say, take this as a guide, and work the mine accordingly, and as intimated above; and in conducting the mine in this way I feel confident of success, which would very naturally encourage the company, and prove a blessing to the district.—Guernsey, Feb. 26.

MINER.

#### OLD BATHOLLES MINE.

SIR,—Can any reader of the Journal tell me what has been done, and what the managers propose to do, at this mine? Twelve months ago I bought shares at 25s., and they are now unsaleable at half that price. Were it a tin mine I could understand this great drop, but the prospects of lead mining, with coal and iron constantly falling, and lead at present price, ought now to be considered good. A friend of mine who visited the district in August last found that the mine was scarcely known there by name, the engine not being at work, and the place apparently deserted. I should be glad to know whether anything is being done at the mine, and if so what number of men are employed, and with what object. If there is no prospect of returns would it not be better to divide what remains than continue in this unsatisfactory manner?—Feb. 26.

AN ENQUIRER.

#### THE VRON UNITED LEAD MINE.

SIR,—I have received, as I suppose have all the shareholders, a circular, signed by Mr. M. South, dated from the office of the liquidators of this mine, inviting the shareholders to subscribe for the purchase, from the liquidators, of the remaining term of the lease, and also to provide sufficient capital to work the mine. I regret my inability to be present in London to attend the meeting called, and therefore put the question publicly I wish answered, which is of great interest to all the shareholders. Is there any foundation for the rumour that the liquidators find that some of the late directors and the vendors are liable for large sums of money on the shares standing in their names? If so, perhaps they will be good enough to cash up and develop the property a little more, for their own as well as for our benefit, as I, for one, do not feel inclined to find more money to explore the treacherous limestone formation of Flintshire. A SHAREHOLDER.

[For remainder of Original Correspondence, see to-day's Journal.]

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### Meetings of Public Companies.

#### THE ELDORADO GOLD MINING COMPANY.

At the adjourned meeting of shareholders, held at the company's registered office, Strand, on Feb. 23, the reports recently received from the mine were considered so satisfactory that the meeting broke up without in any way altering the working of the company. The following is the report from the manager of the mine, dated Feb. 3:—"The unfavourable reports from the mine, I am glad to say, have come to an end now. I think the barren spot we have been working in was only temporary, and the improvement is the continuation of the gold streak in depth and eastward. It gives me pleasure to say that quartz on the Plough increases in quantity and value. Gold for January, 125 ozs., value 500*l.*; cost of mine, 290*l.*; profit, 210*l.*"

#### FLAGSTAFF SILVER MINING COMPANY.

The adjourned third ordinary general meeting was held, on Tuesday, at the London Tavern.

Sir ALEXANDER MALET, Bart, K.C.B., in the chair.

Mr. J. KENDALL GOLE (the secretary) read the notice calling the meeting. There was a large attendance of shareholders.

The CHAIRMAN said that the position of a board which met its shareholders after a year's interval (when they paid 30 per cent. interest), and now came before them with the interest in abeyance, was very materially changed, and the chairman who had to explain the circumstances to the meeting laboured under a double disadvantage—he had to encounter the disappointment and irritation of the shareholders, and he had to fear that he would be unable to do justice to the exertions and efforts of his colleagues. The shareholders would see that a reference to the accounts formed the second paragraph in the report, and undoubtedly that was the most important point to touch upon—the key of the position—for the difficulties and anxieties of the board, and the irritation and disappointment of the shareholders, were all traceable to the impossibility of getting the accounts transmitted with any kind of regularity. The directors promised to give the accounts to the shareholders monthly; they had grievously failed in it, but from no fault of their own. It would occupy much too long a time to enter into the causes of this failure, therefore he would forbear from detailing them with any remarks upon the calculations which formed the striking feature in the report, and which laid before them the enormous production of the mine, and the results which ought to have been obtained. Neither would he allow himself to touch, more than very slightly, upon anything connected with the executive in Utah, because the absence from the meeting of the two gentlemen, who formed the executive there, precluded him from touching upon anything connected with them which might in any way look of the nature of an attack upon absent men—hear, hear; but that did not preclude him from laying before the shareholders those assembled some information which had reached him from a private source, and which had lately been communicated to him by a shareholder, regarding the position and prospects of the mine. The gentleman to whom he had alluded went to the expense of having a private inspection of the mine made at the end of December; and, in speaking of the enormous body of ore, he said there were raised from the mine last year 19,000 tons of ore of the average value of 85*l.* per ton; that there had been no exploration of the mine during the past year, but everything had been sacrificed in order to make returns of ore—in picking the eyes out of the mine, in fact, which anyone acquainted with mining would know was a most improper mode of working. They would remember that at this very moment there were 2000 tons of ore at the smelting works for reduction. The gentleman also observed that the main hoist shaft was not properly connected with the main body of ore in the lower part of the mine, and thereby the expense of raising the ore was very greatly increased. In spite of all these drawbacks and difficulties, it was a great scandal that the mine should not have made a profit of 130,000*l.* The gentleman then went into some details of the working, which he would not refer to, but the conclusion came to this—"Any miner would be glad to get hold of such a mine, and pay 30 per cent. upon the capital invested, and would make a good thing out of it for many years to come." The name of the gentleman who had given that report to the shareholders was Mr. J. Eddie, who was in the country at the time.

A SHAREHOLDER: The Eddie's are well known men in Cornwall.

A SHAREHOLDER: What is the name of the shareholder who made the report of Mr. Eddie?

Mr. W. MAITLAND (a director) said it was a personal friend of his—a holder of 100 shares—a gentleman of high standing, and whom he knew in India. He would not mention that gentleman's name in a public meeting, but he would be happy to give it to any shareholder after the meeting.

Dr. TREWHELLA: Is he here?—Mr. W. MAITLAND: No.

The CHAIRMAN went on to say that he would make one observation as to their present position. In his opinion, every reliance was to be placed on Mr. Patrick, who was to act as the manager of the mine; Mr. Patrick was acquainted with the mine, and would work it in a miner-like way. The shareholders had the nomination of additional members of the board; he hoped they would be men who would actually participate in the duty of managing the company, and would inspire the shareholders with confidence in the future management of the mine. He had heard that the directors last agreement with Mr. Davis (who placed Mr. Patrick in the position in which he was) was strongly objected to. That agreement was made under pressure at the time of the attachment of the property by Capt. Forbes; he expected that when enquiry was made into the circumstances under which the agreement was made, the directors' proceedings would meet with the approval of the shareholders. In the meantime he had to state that Mr. Davis was perfectly prepared to retire from the position he held, and surrender it into the shareholders' hands on these conditions, which were written by Mr. Davis:—"Thinking that perhaps some of the shareholders feel that the contract with me on Dec. 12 last should not be entered into without their consent, and in order that they may act as they deem best, if the company will, within two months, return to me the money advanced, without interest, and release me from all debts, I may become personally liable to, and at the same time give me the assurance that the ore due will be delivered to me, as per agreement, during the present year of 1874, at such times as may be convenient for the company (as the mine is abundantly able to do), I will cheerfully cancel the agreement. I have now, and always had, no intention of embarrassing the company, but to aid, in all my power, the advancement of its interests and prosperity. I hope the shareholders will, at the coming meeting, consider this proposition favourably, and decide to accept it." That letter was dated Feb. 23.

A SHAREHOLDER: Is Mr. Davis present?—The CHAIRMAN said that he was not. The shareholders would accuse him of a grave omission if he did not notice certain publications (some of them anonymous), which, without meaning any offence, he must characterise as "garbled." The directors invited the fullest enquiry, and he might state that the entire correspondence would give very different impressions to those which those partial publications were intended to convey. This was not a pleasant subject to introduce, more especially as some of those publications emanated from a gentleman who was defending his brother, and whom he wished to treat with respect and consideration. He himself retired by rotation, and there were three vacancies to be filled by the shareholders; but he was authorised by the rest of his colleagues (with the exception of Mr. Maitland) to say that they were quite ready to place their seats at the disposal of the meeting. (Cheers.) Under ordinary circumstances he should move the adoption of the report and accounts; but as matters now stood, and as the directors courted enquiry, he would simply move that the report be received.

Mr. TUFELL, in seconding the resolution, said he had hitherto been a silent member at these meetings, but as they met to-day under exceptional circumstances he should be glad to say a few words. There was no doubt from what they had heard and seen that there was on the part of the shareholders a very strong feeling of misgiving as to the conduct of the directors, and as to the value of the mine, and the prospects of the concern. As regarded the question whether the affairs had been properly managed or not, perhaps it was not for him, as a director, to say much. He believed a committee of enquiry would be moved for, and whoever those gentlemen might be, if they (as he had no doubt they would) performed their duties conscientiously, and well looked at the various circumstances as they arose from the same stand point of view which the directors had to regard them from in the very different positions in which they were from time to time placed, his conviction was that the committee would come to the conclusion that, as far as the directors' places, they would not have acted differently. A great deal had been said, and great stress had been laid upon the directors not having called a special meeting. Now he had himself attended nearly all the meetings of the board, and he could say, with perfect truthfulness and confidence, that he had never found on the part of any one member of the board any feeling of reluctance to call a special meeting. The matter had been canvassed over and over again, and he could assure the shareholders that the directors would very cheerfully have summoned a special meeting at any time, if they could have seen that any result was likely to arise; further, the directors would have been simply relieving themselves from responsibility, and taking it from their own shoulders, and placing it on the shoulders of the shareholders. Now, with respect to the question whether the affairs had been administered honestly, on that point he wished to speak very plainly. As far as he knew, he had never received a single shilling of benefit out of this concern in any shape or form beyond his fees, and he believed the same remark applied to all the directors, and those fees had not been touched for the last 12 months, whilst he himself and some of his colleagues had put their hands in their pockets and paid some of the office salaries—their being no money at the bankers—and for which they had not been recompensed. He would now pass to the value of the property. He believed that they possessed a most valuable, he would say an invaluable, property, which he looked upon his shares in the Flagstaff Mine as a sound, good, and eligible investment. He had never sold a share—hear, hear—and he did not mean to do so. As his confidence in the concern had increased he had from time to time increased his holding, and he purchased some shares at 16*l.* 10*s.*, which was almost the highest price they reached. It was not his intention to sell any of his shares, for he looked upon them as a perfectly good investment, and he anticipated that he would not lose a shilling. Whether the affairs were administered by the present board or a new board it could only be a question of a few months before they were in receipt of a good and, he believed, a permanent dividend. (Hear, hear.)

Mr. H. GRAY, of Oakleigh, St. Johns, Ryde, said that he had given notice of his intention to move a resolution to the effect that the present board should resign, but as they had all done so with the exception of Mr. Maitland, he would ask that gentleman whether he would follow the example of the other members of the board, in which case it would not be necessary to move the resolution of which he had given notice.

Mr. W. MAITLAND said he was placed in rather a peculiar position in being asked that question half-an-hour ago in the board-room, and the same answer which he then gave to his colleagues he would, with all due respect, give to the

har holders. The question of having a committee of investigation, and the question whether the directors should resign was no new matter to him. It had not occurred to him within the last few days because he held in his hand a letter dated Jan. 15, addressed to the Chairman, in anticipation of what might take place at the meeting. One question was—"If a committee of enquiry is proposed what ought to be done?" We should, in my opinion, agree to it at once." After what took place in the Tecoma Company he said that the directors, for their own honour, insist upon a committee of enquiry. He moved for a similar committee in connection with the Tecoma Company, and that committee was now sitting. The second question I put was—"If the directors are called upon to resign at once what is to be done?" I think we should not do so until a committee has reported." He stood there in the position of a man who was going to be put upon his trial by the committee of enquiry which would, no doubt, be appointed. When the committee was appointed he would give every information. There was not a single thing which he had done in connection with this company which he had any reason to be ashamed of, or with respect to which he slurred enquiry. Up to a certain point he went with the directors; he took his share of the moral and legal responsibility up to August last, but what had been done since he would not take any moral responsibility for. He would not take the moral responsibility of not calling a meeting of the shareholders, because as far back as October last he wrote from the office of Wright, pressing that a meeting should be held, and it was no fault of his that they had not had a committee of investigation. He was not a shareholder. He would not bear any responsibility for acts in which he had no share or control. Although he was not in union with the directors in all matters, still he believed that they and himself had done what they believed to be right, even in these later matters, but he believed that the other directors had been wrong. The first thing to be done was to appoint a committee of the shareholders, and when that committee had enquired into and examined everything from top to bottom, and had reported to the shareholders, if they (the shareholders) should then be of opinion that he, as well as the other directors, should resign, he should know what to do; but up to that enquiry had taken place he must be permitted to say that he did not resign his seat at the board.

Mr. H. GRAY said that under those circumstances he must move his resolution, and he grounded the resolution on the fact that the directors had paid dividends without having the money to pay them; the dividend of 24 per cent. was raised to 30 per cent., which he considered as dust thrown in the eyes of the shareholders.

A SHAREHOLDER: That was to float the Tecoma. (Hear, hear.)

Mr. GRAY went on to say he believed the dividends were not paid out of profits, and under the Articles of Association they had no right to pay them out of capital. It appeared to him that the dividends were paid in order to bolster up the shares of the company. He begged to move,—"That the present board of directors be called upon to resign, and that a new board, not exceeding five in number, be elected with as little delay as possible."

Mr. COLBORNE, in seconding the resolution, said he had hoped that Mr. Maitland would have joined his colleagues in placing their resignations in the hands of the shareholders, and thus rendering unnecessary such a resolution as this; then new directors could have been appointed with instructions to investigate the affairs of the company from the commencement, for no one connected with the company should be condemned without full, fair, and impartial investigation. (Hear, hear.) He knew one or two of the gentlemen on the board, and if he could by any means have avoided the necessity for a course of investigation he would have done so; but there was the fact that the market value of the shares had been reduced from 450,000*l.* to 90,000*l.*, and yet the directors had not called the shareholders together, as they ought to have done, before they entered into the contract with Mr. Davis. He maintained that the directors, who took the responsibility of the past management of the company, undertook a grievous responsibility. The great object of the directors seemed to have been to keep up the dividends, notwithstanding the fact that Capt. Forbes telegraphed over here to say that the quarterly dividends must be given up. Then he would mention the circular issued by the board on Feb. 11, 1872, giving a report received from Mr. Frames, one of the directors, who personally visited the mine and had remained there 15 months, and this report had been a very encouraging one to the shareholders. The report was of such a satisfactory character that the directors felt justified in raising the dividend from 4*s.* per share, or 24 per cent., to 5*s.* per share, or 30 per cent. This was on Nov. 11, 1872, and he had in his possession a document containing copies of contracts for ore to be delivered within six months, and for which 17,000*l.* had been paid by the Flagstaff Silver Mining Company of Utah (Limited), and this document was signed by Mr. Erwin Davis. Now, this document bore the same date as that in which an increase of dividend was commenced. He (Mr. Colborne) had also a copy of the receipt, which stated that the 17,000*l.* was on account of ore sold by the Flagstaff Company. This money had been received on the following dates:—6000*l.* on June 28, 1872; 5000*l.* on July 20, 1872, and the other 6000*l.* on Sept. 26, 1872. By this it would be seen a sale of ore of the value of 17,000*l.* would have to be made to cover the advances which, if the receipt meant anything, had been already made on the property for the payment of the previous dividends. (Oh, oh.) Now, the Articles of Association provided that the directors should not borrow more than 10,000*l.* without calling the shareholders to consent to it, but this had not been done, although 17,000*l.* had been borrowed from Mr. Davis to pay the dividends up to Nov. 11, 1872; and the subsequent contracts had been provided in the same way down to July, 1873, amounting to 58,700*l.*, for which 4000 tons of ore had to be delivered. He knew from experience in Monmouthshire and Northamptonshire that colliery and other companies were in the habit of making large sales of coal, &c., for delivery, but he had never heard of a colliery company, because they had sold 50,000 tons or 100,000 tons of coal, saying that they had earned for that sale, of which not one ounce had been delivered; the account should only be drawn when the actual bargain was complete and the money paid (hear, hear), and this was the course adopted by the companies with which he had anything to do before (hear, hear), and he would not condone to any other system of management. He hoped that this would be the last example where such a method of business would be carried on by any English company. (Hear, hear.)

On Nov. 11, 1872, the first contract was entered into. The directors in their report at that time congratulated the shareholders on the position of the mine, and the payment of a dividend, making a total of 75,000*l.* at an average rate of 25 per cent. on the paid-up capital of the company as the dividend yield of the mine. The directors also said that the discoveries of ore in the mine could not be strictly regarded as a reserve fund, the directors had in view the formation of a cash reserve in London. (A laugh.) This had so taken him in that on May 16, 1872, he had written to the secretary asking how it was that the shares were depreciating in value, and also as to whether there would be any objection on the part of the directors to let the shareholders know what amount was then being remitted from the mine to the shareholders. He had formed an opinion as to the creation of a reserve. The secretary replied that the depreciation of the shares was caused by the sale of 14,463 tons, after debiting the account with the expense at the mine and the London management, and taking credit for the 61,000*l.* paid in dividends. Another very pleasing feature was that a reserve was being created, there being a balance of 8751*l.* at the bankers. Then, again, the meeting at which the report to which he was referring had been presented had been of a most congratulatory description, and long speeches of congratulation had been made. These speeches had been reported in *extenso* in the Mining Journal of Feb. 8, 1873, and from the speeches it would appear as if the Flagstaff and the Last Chance were really about the only good mines going. That the dividends had been paid, and that during the intermediate six months 6000 tons of ore had been raised, and the dividends were estimated at 30,000 tons, and that the mine had yielded the dividends received by the shareholders, amounting to 75,000*l.*, and the whole of the expenses, 150,000*l.* Throughout the whole report the same tone of congratulation would be found, but nothing had been said about money having been received for ore which at that time had not been taken out of the mine. (Hear, hear.) Those of the shareholders who attended that meeting would perhaps remember that one or two very important points had been pressed upon the board. One was as to the necessity for half-yearly meetings. He thought all companies should have half-yearly meetings, more especially when their works were at such a great distance from the shareholders. Another suggestion had been thrown out, whether it would not be better to pay the dividends quarterly instead of monthly. The assurance of the directors was that there was no necessity for altering the payments of the dividends, for that there was every probability of maintaining the monthly dividend. Mr. Maitland, as one of the directors, had himself confessed that it had been a most serious error. (Hear.) The report presented on the present occasion seemed to be a mere personal reply of Capt. Forbes, and having nothing to do with the shareholders. The shareholders had to hold the directors responsible for the officials, and it was quite a new doctrine, and one which would never gain ground, for the directors to endeavour to escape responsibility by saying that they have had competent officials over whom they had no control. This report could only be taken as an admission on the part of the board that their management, their control, and their supervision of the mine had entirely and actually broken down—hear, hear—and that they could not check gross mismanagement. (Applause.) This account on one side showed the expenses in Utah, 12,000*l.*, and the London expenses 7000*l.*; he believed this included the directors' fees not yet paid, making a gross outlay of something like 133,000*l.*, to get what? Sale of bullion, 80,422*l.*; and sale of ore, 55,577*l.* There was, then, an item in the revenue which had no business to appear there, it was ore at mine for delivery as per agreement, 31,650*l.*, 8*s.* 11*d.*, and a further note says "4900 tons remain to be delivered;" consequently, although the 31,650*l.* was treated as income this year, the ore for which it was the payment had not been delivered, and he said it was practically a mortgage on the mine. (Hear, hear, and No, No.) Then on the gross balance-sheet would also be found the loan from Mr. Davis, as referred to in Capt. Forbes's correspondence in 1873. Sir Alexander Malet, in alluding to the report, did not pledge himself to the correctness of the accounts, and he (Mr. Colborne) thought, after what the shareholders had seen of the 1872 affairs, that they could not receive these accounts as exact without some investigation. At the bottom of the accounts there was a foot-note from Mr. Ford, as follows:—"I have examined the above accounts with the books of the company, and find they agree. The Utah vouchers, which will take months to examine and check, have not yet been gone into." He could not understand that Mr. de Metz had spent three months in Utah, and was occupied by books from June, 1872, if the books up to November, 1872, were relied upon as genuine, and the accounts up to June, 1872, had been already passed. They should not have been passed if the board were not satisfied that they were genuine.

Mr. COLBORNE explained that "1872" was a misprint, it should have been 1873. The CHAIRMAN said that made a great deal of difference, but it showed that in 1872 the sum of 25,000*l.* had been received from Mr. Davis for sales of ore on delivery, and that should not be put down as income. (Hear, hear.) He would not accuse the directors of anything but mismanagement. He did not wish to put it harshly, but he was quite sure that nothing he could say would add to the pain which had been spread throughout many a family, where the shares had in some cases been held by children for their savings, and by retired tradesmen after a life of hard work. The letters he had received respecting the affair were most harrowing. (Hear, hear.) He thought no one could feel it more than the Chairman, and he would be very sorry to add anything which might hurt the feelings of the Chairman, and he was now proposing that the board should resign, and that the new board should be armed with a resolution. That the report of the directors, the new board, and that a committee, to consist of not less than five members, holding at least 40 shares each, be forthwith appointed, for the purpose of examining such report, and investigating the affairs and accounts of the company from the commencement, particularly with reference to the receipts from the mine, the payment of dividends, and the proceedings of the vendors, directors, and other officers of the company, &c. It was proposed that the qualification of the directors should be

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er levels. The lead is more impregnated through the lode than usual, and, being the case, gives us a large quantity of stamping stuff; for the last 10 fms.



wide, and worth from 15 to 20 cwt. per fathom. We have a level driving north from the winze at the 175 south, which is nearly the same level as the 190; the lode in this end is 4 ft. wide, worth 14 cwt. of lead per fathom. There is about 20 fms. of ground between these two points, and from present appearances we may hope for a good piece of ground between these ends, and against another meeting we shall make the communication. The lode south from that winze in the present end is 1 ft. wide, and worth 8 cwt. of lead per fathom. The lode in the 175 south is 1 ft. wide, yielding some stones of lead, but nothing to value. The lode in the 190 north is 2 ft. wide, worth 5 cwt. of lead per fathom. The stopes throughout the mine continue to yield a fair average—about 9 cwt. of lead per fathom. The machinery, both at surface and underground, continues in good order. We have managed to meet the extra month's cost in this four months' returns, notwithstanding having, like other mines, to encounter with costly labour and high price materials; but the greatest drawback we have met with is that our lead does not contain the silver it formerly did, and we lose fully 7½ per cent. to our former prices. The improvement at the 190 is of great importance to us, and gives some little encouragement for the future.—THOMAS TREVILLION.

#### THE SUCCESS, RUSHY CLIFF, AND NANCY CONSOLS LEAD MINING COMPANY.

The second half-yearly meeting of shareholders was held in the Athenaeum Room, Derby, on Monday, Mr. E. C. SWINDEN in the chair. The SECRETARY having read the notice convening the meeting.

The CHAIRMAN said he had pleasure in submitting the second half-yearly report and balance-sheet to the shareholders, of which they had each received a copy, and before he asked them to pass it he should be glad to answer any questions they might like to put to him.

The directors, in their report, say—"In December the directors thought it advisable to have the mines inspected by Capt. Roach, of the Van Consols Mines, in order to have a correct idea as to the progress which had been made, and in regard to the future prospects. Capt. Roach's report is enclosed, from which it will be seen that he is perfectly satisfied both with the work done and with the prospects of the mines."

Capt. Henry Francis, the manager, says—"I have not seen anything whatever to alter my views and opinion so often and so fully hitherto expressed of the successful results that will attend a vigorous prosecution or working of these mines. On the contrary, I am more than ever convinced of the value and importance of this fine property."

Capt. James Roach says—"I believe if you work in depth you will get very profitable mines; therefore I do not hesitate to recommend it."

A SHAREHOLDERS' proposal, and it was seconded and carried unanimously, that the directors offer 100 shares for subscription, leaving 2000 on hand, and that the present proprietary be allowed till the end of March to take up any number of those shares at par. The reports and balance-sheet were adopted; Messrs. Baghurst and Kay were elected directors; Mr. T. H. Harrison was re-elected auditor; and a vote of thanks to the Chairman concluded the business.

#### DYLIFFE LEAD MINING COMPANY.

The first ordinary general meeting was held at the company's offices, Palmerston-buildings, on Wednesday, Mr. O. B. SHORE in the chair.

Mr. E. J. BURGESS (the secretary) read the notice convening the meeting, and the balance-sheet for the seven months ending December, 1873, showing an available balance of 9316½s. 8d., together with the reports of the directors and agents, were read.

The directors have pleasure in meeting the shareholders at this first ordinary general meeting, and submitting to them the statement of accounts, as well as a report of the agents of the mines. It will be remembered that on the conclusion of negotiations for the purchase of these mines (some 12 months ago), which were then more familiarly known as "Bright and Colson's Mines," and on formation of the present company, it was determined to vigorously open out the mines in the most expeditious manner. At the meeting of shareholders in October last, which was held in conformity with the Joint Stock Companies Act, a report of directors and another from the agent were then read, which fully pointed out what was being done and the work in contemplation. The directors now have to report that, with a view to developing the resources of the mine by a vigorous prosecution, a large outlay has been made, having employed nearly double the number of miners and workpeople to accomplish this object. Important alterations and additions have been made in the ore floors and dressing machinery at a considerable cost, which, however, instead of being finished by the contractor in September, was not completed until last month. Other alterations and improvements must be gradually made, and one of importance will be to construct the necessary requirements so as to extract the lead ore out of the "skinnings" hitherto carried away to the waste heap. An analysis of some of the heavy items of expenditure embraced in the statement of accounts is as follows:—Sinking shafts, driving levels, stoping, tramming, &c., 60000; dressing cost, timbering, banking, &c., 10000; engine-men, smiths, carpenters, sawyers, carters, &c., 10500; new plunger, jigger, shafting, haulers, bidders, &c., 3000; repairing workshops, cottages, stables, roads, &c., clearing lime pools, furniture, &c., 4000; nine new horses (total number now 16), 4500; new timber wagon, harness, &c., 600; iron tram wagons, new clow 1000, 2500; timber of all sorts, 4000; iron and steel, 2200; coals, 3500; candles, 2000; powder, 2000; fire, oil, grease and tallow, nails, bolts, ropes, shovels, 2500; cruetler roll (new), 1100; leather, belting, &c., 1600; carriage of ore and materials, &c., 4000; total, 115400. During the same period the ground opened, as will be seen by the agents' report, is as follows:—Sinking shafts, winzes, clearing, timbering, &c., 92 fms.; driving different levels, &c., 518 fms. 1 ft.; stoping in different levels, 1107 fms. 4 ft.; making a total amount opened of 1717 fms. 5 ft. Notwithstanding the alterations on the dressing floors, and the interruptions occasioned thereby, 560 tons of lead ore have been sold, realising 7828½s. 14s. 8d.

It may not be out of place here to remind the shareholders that Captain Arthur Waters, the manager of Roman Gravel and Tankerville Mines, in his extensive report on the Dyflife Mines, some 12 months ago, stated that the length of ore ground laid open on the Dyflife lode from first to last is in round numbers about 265 fathoms. The lode throughout this ground was of great width, and yielded ore in extraordinary quantities, and the only lode he had ever seen whose width and productiveness and general character were analogous in any way to this was the Van lode, or, as he termed it, the sister lode to the Van lode. At the time he inspected a cross-cut was driven at the 105 some 10 fathoms, leaving 20 fathoms to drive to intersect the lode; this has been done, and has been the means of opening out a fine run of ore ground for some 43 fathoms in length, and as the shaft is now nearly down to the 120, a cross-cut will be put out to reach the lode at this level, when important discoveries are expected to be made, and the lode will be opened out to a great extent. Mr. Walter Eddy, who reported on the mine for Sir Watkin W. Wynne, stated that with the large quantity of ground undeveloped in every one of the veins, and the capital indications presented for ore in so many places, he saw no reason why the mine should not prove as rich and make as large dividends in the future as it had done in the past working, and he felt confident that such would be the result.

The satisfactory report of Captains Evans and Roberts, the agents at the mines, enters fully into the progress that has been made both underground and at surface, that your directors need not here occupy your attention with further details, hoping, however, as they believe, that their anticipations will be realised. Your directors have visited the mines on several occasions, and from the information they can obtain, they believe that by a continued vigorous development further important discoveries of ore will be made, and the mines become highly remunerative to the shareholders.

The CHAIRMAN could add little to what they had heard from the report. The directors had been anxious to produce profits, but the shareholders when they saw how the money had been expended would admit that that was impossible, seeing the large outlay. He had been over the mine recently and had held long consultations with the agents, and they were quite satisfied that they had a good mine, and that in six or twelve months they might increase their returns permanently. They were going down under ground from which the former proprietors got large returns. Of course the directors could make no definite promise, but they hoped that in going down they would get some good ore. Altogether their prospects were very good indeed. As to the accounts, he thought it was very satisfactory that they had completely cleared the way by their sales of ore, and they had a good reserve at their bankers. The mine was in a very different position as to machinery and otherwise from when they took possession; they had doubled the number of men underground, and they appeared to have a large amount of work for the six months they had been at work. He was not himself able to give a very reliable opinion upon that point, but Mr. Watson told him that they had done as much as might reasonably have been expected in 18 months. He concluded by formally moving that the report and accounts be received and adopted.

Mr. MONTGOMERY enquired what portion of their capital remained unexpended? The CHAIRMAN said they had in round numbers 90000, on deposit and 20000, in bills. He reminded the shareholders that they were bound to spend 100,000, in opening out the mine.

Mr. MUTTELBURY suggested that the accounts should be prepared so as to show capital account and profit and loss account separately, and that in future the statements should be forwarded to the shareholders a few days before the meeting, so that they might have an opportunity of examining them. He was quite satisfied with the directors. He would like to know, moreover, if the captains were satisfied that they would ultimately be enabled to pay the dividends promised, for he considered that with the return of 100 tons per month they could not pay large dividends. He made some further remarks as to a quotation in the Stock Exchange.

Dr. BURTON said that only a few weeks since he had seen Capt. Evans at Machynlleth, and that he stated most decidedly that within four or five months at most good discoveries might reasonably be expected. Mr. Muttebury had stated that 150 tons would not pay them 10 per cent. He did not agree with the statement, and would remind him that only eight years since Dyflife had paid 75 per cent. upon a capital of 40,000. It was a very good district, but the bunches were very large, and there was no reason to suppose that they would not come upon equally rich bunches as they went down. He was sure Capt. Evans candidly believed the reports he wrote, and he fully anticipated that within five months they might expect rich discoveries on the old Dyflife lode.

The CHAIRMAN said that the present accounts were for the seven months to the end of the year, and were prepared that the shareholders might have full information. They intended, however, to present capital and profit and loss accounts at the end of the company's financial year.

Mr. PETER WATSON observed that when the property was purchased they found that it had been a mighty undertaking, that it had been worked for generations, and that from the surface down to the present depth enormous quantities of ore had been taken from it. He believed it was one of the richest mines in Wales, and this was confirmed by Capt. Waters' report, which showed the lode to be rich, and that they would be rewarded when the levels were driven. There was a little ore in sight when the property was taken over, but they had spent 12,000, since the company was registered, on June 5, and were now in a very different

position. They could have spent much less, no doubt; but then it would have taken them a year or two to do what they had done in the seven months. The sooner they put men to drive, the sooner they would get under the ore ground gone down about 100 fms. He might tell them that at the 92 fathom level they went through 23 fathoms of ore ground, and that in driving under it at the 105 fathom level the length had increased to 43 fathoms, and in developing this 43 fathoms enough ore had been discovered to equal the amount of outlay which the company had made. It did not matter to him whether the mine was quoted on the Stock Exchange or anywhere else, but he would tell them that seven-eighths of the home mines were not quoted on the Stock Exchange, and that quotation was of no practical value. The Roman Gravel and other mines in which he was interested were not quoted, yet they found no inconvenience to result. Miners, one of our richest lead mines, was never quoted on the Stock Exchange, and in fact but very few valuable mines were quoted there. Mr. Muttebury had expressed the opinion that they could not pay 10 per cent., but he was of a different opinion. The ore they had in the 105 was enough to satisfy him, but it did not follow that because they had gone through rich ore they could at once get it away economically. It was necessary to provide ventilation by the sinking of winzes, to lay tramway, and do various other work, but this only involved a little time. They were sinking for a 120 fm. level, and they might expect that when they drove at that depth they would have more than the 43 fms. of ore ground. They had doubled the number of men underground, and he would like to see twice the number they now had. In seconding the adoption of the report he would remark that they might congratulate themselves upon having such a valuable property, and that the directors would not recommend a dividend which could not be continued. (Heard.)

The reports and accounts were then unanimously adopted, it being understood that the accounts should be re-prepared in another form, so as to show capital and profit and loss accounts separately, before sending them to the shareholders. Mr. Archibald Stewart was, upon the proposition of Mr. MONTGOMERY, seconded by Mr. DAVIS, re-appointed auditor, at a salary of 200. per annum; and the thanks of the meeting having been voted to the Chairman and directors, and acknowledged, the proceedings terminated.

#### GOBBETT TIN MINING COMPANY.

A general meeting of shareholders was held at the London Tavern, on Monday, Mr. GEORGE WELLS OWEN in the chair.

Mr. R. L. GRANT (secretary) read the notice convening the meeting. The report of the directors stated that they have the pleasure of reporting the works are all progressing most satisfactorily. All the machinery for stamping and dressing has now been completed, and a small parcel of tin is ready for market, which has been dressed from the surface burrows, and from the ore met with in sinking the shaft and clearing out the old workings. The engine-shaft is now down to the 12 fm. level, and works are being driven east and west to open out new ore ground. The directors have every confidence that as soon as the works for opening out this mine, which have from various causes taken a longer time than was expected, are completed the results will fully justify the views they have always entertained of the value of the property.

The CHAIRMAN said that Mr. Muddele, one of the directors, visited the mine once a month, and otherwise attended to its details, and he would call upon that gentleman to state its position and prospects.

Mr. MUDDELE, in a lengthy statement, mentioned that the machinery was in good working order, while all the appliances were complete, so far as the new work went, for active operation. The old water-wheel, however, was in a feeble state, and eventually a new one would be required. The delay in the completion of some of the works had prevented them reaching the riches awaiting development. Their abundant and ceaseless water-supply he considered was equal to a dividend of 5 per cent. Their appliances for raising and treatment were equal to 20 tons of ore per day; an average of only 1 per cent. would enable them to pay a dividend of 15 per cent., whereas a very much higher percentage could be relied upon. The main shaft had been sunk 12 fms. from the adit, which was 7 fms. from surface; it had cost 12½ per fathom to increase the dimensions of the shaft, and there were only 2 fms. to complete it to the present bottom. The old works had extended one level for a distance of about 50 fms. east and west; about 25 fms. had been cleared, and some very good tinstones had already been found in the eastern drive; the western drive was at present wet and troublesome, but from reports they had reason to expect they would find some good paying work in that direction. The principle, however, to be adopted to ensure a good and lasting dividend-paying mine was to sink the present engine-shaft 10 or 12 fms. below the present bottom. That would cost about 2500, but some paying stuff would be found during the operation. The balance-sheet had shown that funds were absolutely necessary, but he did not apprehend that would now long be the case if shareholders would but spare the time to visit the mine, and judge for themselves of its intrinsic worth. The manager (Capt. Browning) had shown his confidence by accepting an unremunerative salary, satisfied to await results, and to receive 5 per cent. upon the dividends paid to the shareholders.

Mr. MORAN said he should be perfectly satisfied if he did not receive a dividend for the next twelve months, but thought it a pity the accounts did not show clearly the expenditure on capital and the amount returned upon revenue.

The CHAIRMAN said he had always held it as of the first importance that the accounts of a limited company should be made out in the manner imposed by the Board of Trade upon railway companies; but, as far as this company was at present concerned, the whole expenditure had been on capital account; in the works carried on, however, they had raised stuff containing tin, but the amount actually ready for market was only 1½ tons, for which it was scarcely worth while to make a separate revenue account. He hoped, however, in future a sufficient amount would be produced to enable them to present a satisfactory revenue account. The vendor agreed to accept as part of the purchase money 15000, in debentures, so that he received in cash 5000—an amount that would scarcely pay for a part of the machinery. Nearly the whole of the capital subscribed had, in fact, been obtained by the exertions of the directors. He was perfectly satisfied their proper course was to sink the main shaft 10 or 12 fathoms, and thus reach virgin ground. The tin was worth 2½ lbs. per ton more than the produce of Cornwall, on account of its freedom from sulphur; everyone connected with the tin trade knew that, notwithstanding the present low price, brought about by the temporary returns from Queensland, its value would advance. To ensure a permanent success, and make the Gobbett Mine a remunerative investment, they required 15000, to 20000, and although he was already interested in the company, and believed there would be no difficulty in raising the additional capital necessary, he was perfectly willing to head the subscription, and he had always held it as of the first importance that the accounts of a limited company should be made out in the manner imposed by the Board of Trade upon railway companies; but, as far as this company was at present concerned, the whole expenditure had been on capital account; in the works carried on, however, they had raised stuff containing tin, but the amount actually ready for market was only 1½ tons, for which it was scarcely worth while to make a separate revenue account. He hoped, however, in future a sufficient amount would be produced to enable them to present a satisfactory revenue account. 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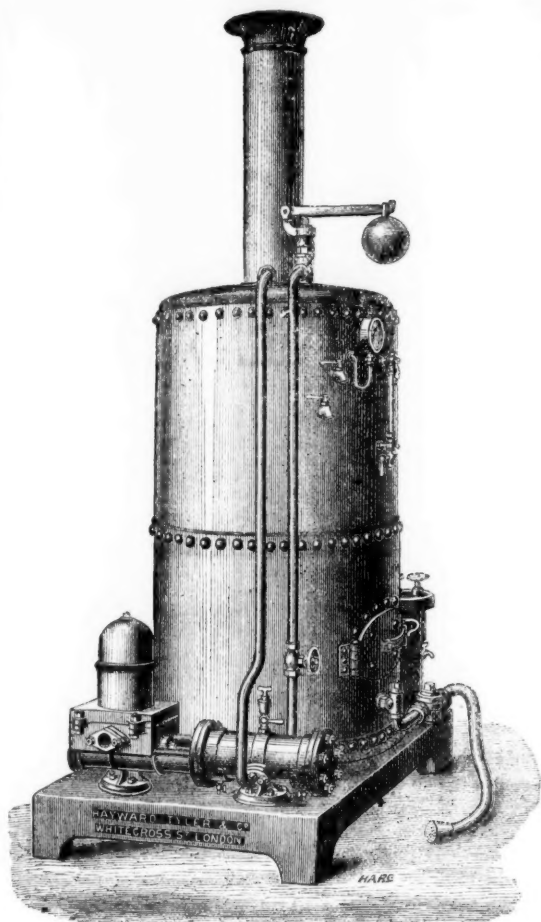
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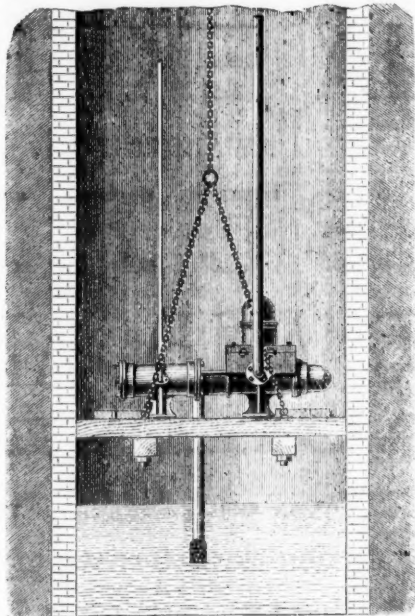
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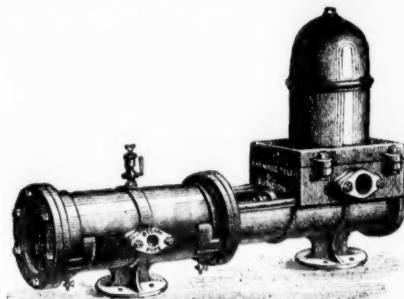
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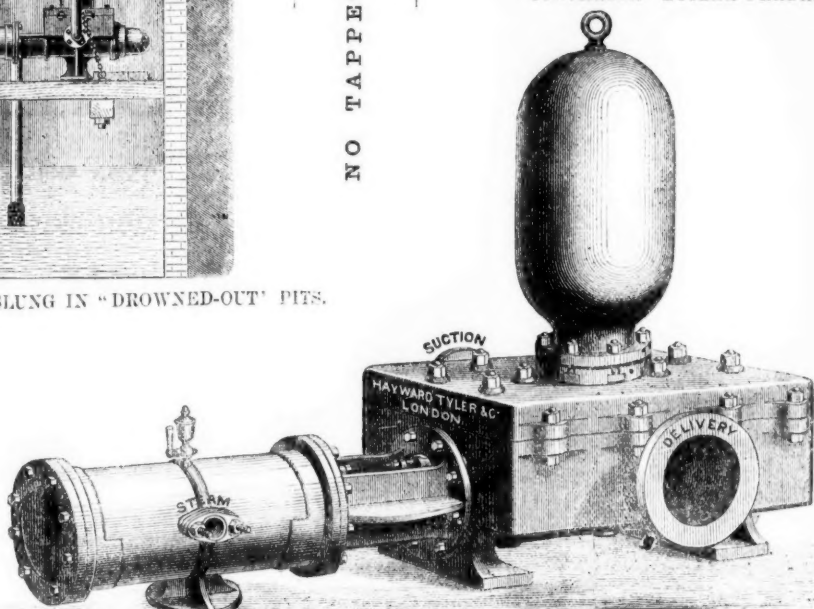
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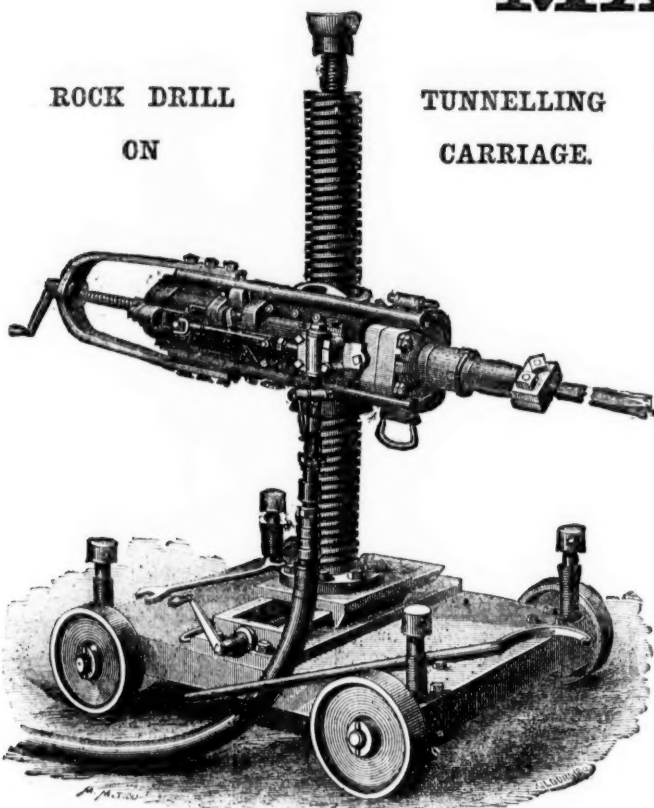


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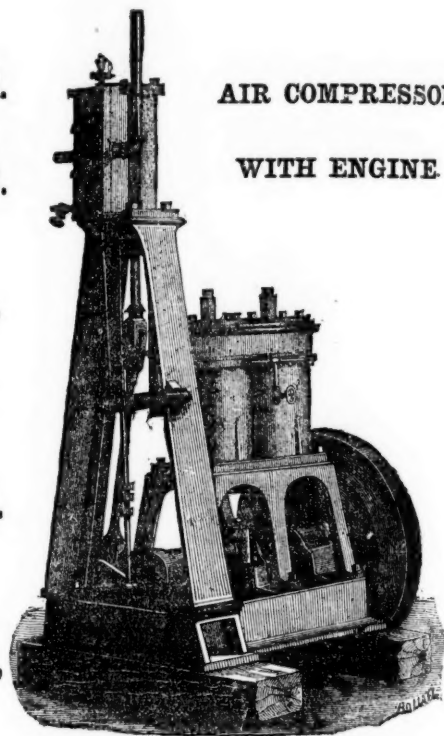
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Extract from Paper read before the British Association at Bradford, 1873, on Brain's System of Mining and Shafting Sinking at the Drybrook Iron Mines, Forest of Dean, using the "Burleigh" Rock Drilling and Air Compressing Machinery:

(Shaft 10 ft. Diameter.)

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During a Fortnight.

|  |          |
|--|----------|
| Sinkers, twelve, 12 days each, at 5s. 6d. . . . .      | £39 12 0 |
| Water Fillers, three, 12 days each, at 3s. 6d. . . . . | 6 6 0    |
| Blasting powder . . . . .                              | 1 2 0    |
| Total . . . . .  | £47 0 0  |

Depth Sunk 3 yards—Cost per yard . . . £15 13s. 4d.

THE ABOVE STATEMENT REPRESENTS WHAT IS NOW BEING DONE AT THE ABOVE MINE.

#### ADDITIONAL TESTIMONY.

(COPY.)

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DEAR SIR,—I have much pleasure in informing you that the Rock Drill and High-pressure Boiler, with which you supplied us, are both working extremely well.

I am, yours truly,

(COPY.)

DEAR SIR,—In reply to yours of 2nd inst., I am sorry I have not time to go into the comparative results of hand labour in sinking with that of the work done by your "Burleigh Drill." All I can say is, that for the last few months it has been giving me every satisfaction, and there is a marked difference in the progress of our sinking operations.

I am, yours truly,

JOHN MAIN.

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During a Fortnight.

|   |         |
|---|---------|
| Sinkers, three, 12 days each, at 5s. 9d. . . . .                | £10 7 0 |
| Labourers, six, 12 days each, at 3s. 6d. . . . .                | 12 12 0 |
| Engine Stokers, two, 12 days each, at 2s. 6d. . . . .           | 3 0 0   |
| Dynamite, 60 lbs., at 2s. . . . .                               | 6 0 0   |
| Electric Fuses (Brain's) 20 per day, at say 6d. each . . . . .  | 6 0 0   |
| Coal for Air Compressing Engine, 12 tons small, at 10s. . . . . | 6 0 0   |
| Oil for engines . . . . .                                       | 0 5 0   |
| Total . . . . .   | £44 4 0 |

Depth Sunk 5 yards—Cost per yard . . . £8 16s. 9d.

*The Weardale Iron and Coal Company, via Darlington, Sept. 6th, 1873.*

(For the Weardale Iron and Coal Company, Limited),

J. R. CRONE.

*Crossfield Iron Ore Works, Crossfield Moor Row, via Carnforth, Sept. 8th, 1873.*





THE HIGHEST PRIZE  
AND ONLY MEDAL "FOR PROGRESS"  
FOR DIRECT-ACTING

STEAM PUMPING ENGINES,

FOR MINING AND GENERAL PURPOSES, WAS

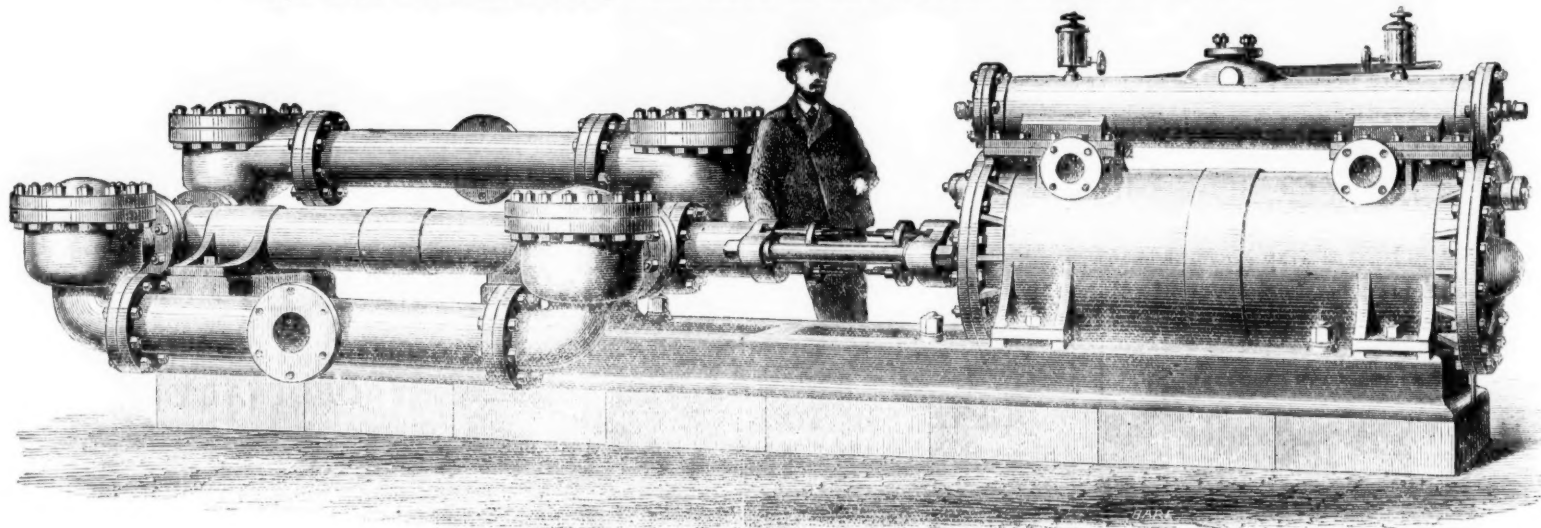
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TO

TANGYE BROTHERS AND HOLMAN, LONDON,  
FOR

"THE SPECIAL"  
DIRECT-ACTING STEAM PUMPS.

OVER 3000 IN USE, AGGREGATING 25,000 HORSE-POWER. 200 SIZES AND COMBINATIONS OF THESE PUMPS ARE NOW MADE.  
ALL ARE DOUBLE-ACTING, AND HAVE SHORT PISTONS AND LONG STROKES.



The "SPECIAL" Direct-acting Steam Pumping Engines require no costly Engine Houses or massive foundations, no repetition of Plunger Lifts, ponderous Connecting Rods, or complication of Pitwork, and allow a clear shaft for hauling purposes.

THE "SPECIAL" DIRECT-ACTING STEAM PUMPING ENGINE is the most simple, powerful, economical, and successful appliance for deep mine draining and general purposes of pumping ever practically developed, and the first cost is very moderate compared with the method of raising water from great depths by a series of 40 or 50 fathom lifts. They are all fitted with Holman's Patent Buffer Valves, which are reliable and durable under 1500 feet head. Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

The "Special" Steam Pumping Engines are in use at the following among many other Collieries:—

| The Special Steam Pumping Engines are in use at the following and many other Collieries. |    |                     |   |                           |   |                        |   |                         |   |                      |   |
|--|----|---------------------|---|---------------------------|---|------------------------|---|-------------------------|---|----------------------|---|
| Pumps supplied.  |    | Pumps supplied.     |   | Pumps supplied.           |   | Pumps supplied.        |   | Pumps supplied.         |   | Pumps supplied.      |   |
| Acomb .....  | 1  | Caprington .....    | 1 | Gnoll .....               | 1 | Newton Cap .....       | 1 | Shilbottle .....        | 2 | Wardley .....        | 1 |
| Adelaide .....   | 4  | Castle Eden .....   | 4 | Haswell .....             | 4 | Nerquis .....          | 1 | Shildon .....           | 3 | Washington .....     | 1 |
| Ashington .....  | 1  | Chell .....         | 1 | Inkerman .....            | 2 | North Bitchburn .....  | 1 | Shotton .....           | 3 | Waterhouses .....    | 1 |
| Bell Brothers .....  | 6  | Cornsay .....       | 4 | Kilton Iron Company ..... | 2 | North Brancepeth ..... | 1 | Silverdale .....        | 1 | Wearmouth .....      | 1 |
| Black Fell .....   | 1  | Darfield Main ..... | 3 | Lambton .....             | 2 | North Seaton .....     | 1 | South Brenwell .....    | 5 | Waterloo .....       | 1 |
| Black Prince .....   | 1  | Denend .....        | 1 | Lintz .....               | 3 | Old Flockton .....     | 2 | St. John's .....        | 2 | West Bitchburn ..... | 1 |
| Bolelaw, Vaughan, and Co. ..   | 11 | Dinnington .....    | 2 | Lancashire .....          | 2 | Oakenshaw .....        | 1 | Strafford .....         | 2 | West Thornley .....  | 1 |
| Brancepeth .....   | 1  | Donisthorpe .....   | 1 | Llynvi .....              | 1 | Old Thornley .....     | 1 | Stanrigg .....          | 1 | West Yorkshire ..... | 1 |
| Brandon .....  | 1  | Drumgray .....      | 1 | Lochore .....             | 4 | Pense's West .....     | 1 | Sutton Heath .....      | 1 | West Lanes .....     | 1 |
| Briggs, H., Son and Co. ..   | 1  | Dunfermline .....   | 1 | Longhurst .....           | 1 | Pegswood .....         | 1 | Thornley .....          | 3 | Whitefield .....     | 1 |
| Brinkburn .....  | 1  | Eckington .....     | 1 | Lumley Thicks .....       | 1 | Pelton .....           | 1 | Tindale .....           | 2 | Whitworth .....      | 6 |
| Brownrigg .....  | 1  | Etherley .....      | 4 | Marley Hill .....         | 1 | Pontyclere .....       | 2 | Trimdon Grange .....    | 1 | Widdrington .....    | 5 |
| Bretby .....   | 2  | Fell .....          | 3 | Milkwell Burn .....       | 2 | Queensferry .....      | 2 | Tudhoe .....            | 9 | Worsbro' Dale .....  | 2 |
| Butterknowle .....   | 3  | Findon Hill .....   | 3 | New Brancepeth .....      | 3 | Railey Fell .....      | 1 | Tudhoe Grange .....     | 2 | Worcester .....      | 4 |
| Cambois .....  | 1  | George .....        | 1 | New Copley .....          | 3 | Seaton Delaval .....   | 2 | Victoria .....          | 1 | Workington .....     | 1 |
| Cambusnethan .....   | 1  |                     |   | Newton .....              | 4 | Shire Oaks .....       | 2 | Vobster and Mells ..... | 2 |                      |   |

PARTICULARS OF THE "SPECIAL" STEAM PUMPING ENGINES SUITABLE FOR HIGH LIFTS IN MINES.

|  | 6     | 7     | 8     | 10    | 12    | 7     | 8     | 10    | 12    | 14    | 16    | 8     | 10    | 12    | 14    | 16    | 18    | 21    | 10    | 12    | 14    | 16    |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Diameter of Steam Cylinder .....   | 6     | 7     | 8     | 10    | 12    | 7     | 8     | 10    | 12    | 14    | 16    | 8     | 10    | 12    | 14    | 16    | 18    | 21    | 10    | 12    | 14    | 16    |
| Diameter of Water Cylinder .....   | 3     | 3     | 3     | 3     | 3     | 4     | 4     | 4     | 4     | 4     | 4     | 5     | 5     | 5     | 5     | 5     | 5     | 5     | 6     | 6     | 6     | 6     |
| Length of Stroke .....   | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    | 24    |
| Gallons per hour, approximate .....  | 2,200 | 2,200 | 2,200 | 2,200 | 2,200 | 3,900 | 3,900 | 3,900 | 3,900 | 3,900 | 3,900 | 6,100 | 6,100 | 6,100 | 6,100 | 6,100 | 6,100 | 6,100 | 8,800 | 8,800 | 8,800 | 8,800 |
| Height in feet to which water can be raised with 30 lbs. pressure per square inch of steam, or compressed air, at pump ..... | 180   | 244   | 319   | 500   | 720   | 137   | 180   | 281   | 405   | 551   | 720   | 115   | 180   | 259   | 352   | 461   | 581   | 793   | 124   | 180   | 247   | 320   |
| Ditto ditto at 40 lbs. .....   | 240   | 325   | 425   | 665   | 960   | 183   | 240   | 375   | 540   | 735   | 960   | 153   | 240   | 345   | 470   | 615   | 775   | 1,058 | 166   | 240   | 330   | 426   |
| Ditto ditto at 50 lbs. .....   | 300   | 406   | 531   | 831   | 1,200 | 228   | 300   | 468   | 675   | 918   | 1,200 | 191   | 300   | 431   | 587   | 768   | 968   | 1,322 | 207   | 300   | 412   | 532   |

PARTICULARS, &c.—Continued.

|  | 18    | 21    | 24    | 26    | 12     | 14     | 16     | 18     | 21     | 24     | 26     | 30     | 14     | 16     | 18     | 21     | 24     | 26     | 30     | 32     | 16     | 18     |
|--|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Diameter of Steam Cylinder .....   | 18    | 21    | 24    | 26    | 12     | 14     | 16     | 18     | 21     | 24     | 26     | 30     | 14     | 16     | 18     | 21     | 24     | 26     | 30     | 32     | 16     | 18     |
| Diameter of Water Cylinder .....   | 6     | 6     | 6     | 6     | 7      | 7      | 7      | 7      | 7      | 7      | 7      | 7      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 9      | 9      |
| Length of Stroke .....   | 36    | 48    | 48    | 72    | 24     | 24     | 36     | 36     | 48     | 48     | 48     | 72     | 24     | 24     | 36     | 48     | 48     | 48     | 48     | 72     | 24     | 36     |
| Gallons per hour, approximate .....  | 8,800 | 8,800 | 8,800 | 8,800 | 11,900 | 11,900 | 11,900 | 11,900 | 11,900 | 11,900 | 11,900 | 11,900 | 15,360 | 15,660 | 15,660 | 15,660 | 15,660 | 15,660 | 15,660 | 15,660 | 19,800 | 19,800 |
| Height in feet to which water can be raised with 30 lbs. pressure per square inch of steam, or compressed air, at pump ..... | 405   | 555   | 720   | 855   | 135    | 180    | 234    | 300    | 405    | 525    | 620    | 825    | 137    | 180    | 225    | 310    | 405    | 475    | 630    | 720    | 142    | 180    |
| Ditto ditto at 40 lbs. .....   | 540   | 740   | 960   | 1,140 | 180    | 240    | 312    | 400    | 540    | 700    | 827    | 1,100  | 183    | 240    | 300    | 413    | 540    | 633    | 840    | 960    | 190    | 240    |
| Ditto ditto at 50 lbs. .....   | 675   | 925   | 1,200 | 1,425 | 225    | 300    | 390    | 500    | 675    | 875    | 1,033  | 1,375  | 228    | 300    | 375    | 516    | 675    | 791    | 1,050  | 1,200  | 237    | 300    |

PARTICULARS, &c.—Continued.

|  | 21     | 24     | 26     | 30     | 32     | 18     | 21     | 24     | 26     | 30     | 32     | 18     | 21     | 24     | 26     | 30     | 32     | 21     | 24     | 26     | 30     | 32     |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Diameter of Steam Cylinder .....   | 21     | 24     | 26     | 30     | 32     | 18     | 21     | 24     | 26     | 30     | 32     | 18     | 21     | 24     | 26     | 30     | 32     | 21     | 24     | 26     | 30     | 32     |
| Diameter of Water Cylinder .....   | 9      | 9      | 9      | 9      | 9      | 10     | 10     | 10     | 10     | 10     | 10     | 12     | 12     | 12     | 12     | 12     | 12     | 14     | 14     | 14     | 14     | 14     |
| Length of Stroke .....   | 36     | 48     | 48     | 48     | 72     | 36     | 36     | 36     | 48     | 48     | 48     | 72     | 36     | 36     | 48     | 48     | 48     | 36     | 36     | 48     | 48     | 72     |
| Gallons per hour, approximate .....  | 19,800 | 19,800 | 19,800 | 19,800 | 19,800 | 24,400 | 24,400 | 24,400 | 24,400 | 24,400 | 24,400 | 35,240 | 35,240 | 35,240 | 35,240 | 35,240 | 35,240 | 47,960 | 47,960 | 47,960 | 47,960 | 47,960 |
| Height in feet to which water can be raised with 30 lbs. pressure per square inch of steam, or compressed air, at pump ..... | 244    | 320    | 375    | 500    | 568    | 146    | 198    | 258    | 303    | 405    | 468    | 101    | 137    | 180    | 211    | 281    | 320    | 101    | 127    | 150    | 206    | 254    |
| Ditto ditto at 40 lbs. .....   | 326    | 427    | 500    | 665    | 758    | 195    | 264    | 345    | 405    | 540    | 625    | 135    | 183    | 240    | 282    | 375    | 426    | 135    | 170    | 200    | 275    | 313    |
| Ditto ditto at 50 lbs. .....   | 407    | 533    | 625    | 831    | 947    | 243    | 330    | 431    | 506    | 675    | 781    | 168    | 228    | 300    | 352    | 463    | 532    | 168    | 212    | 250    | 343    | 391    |

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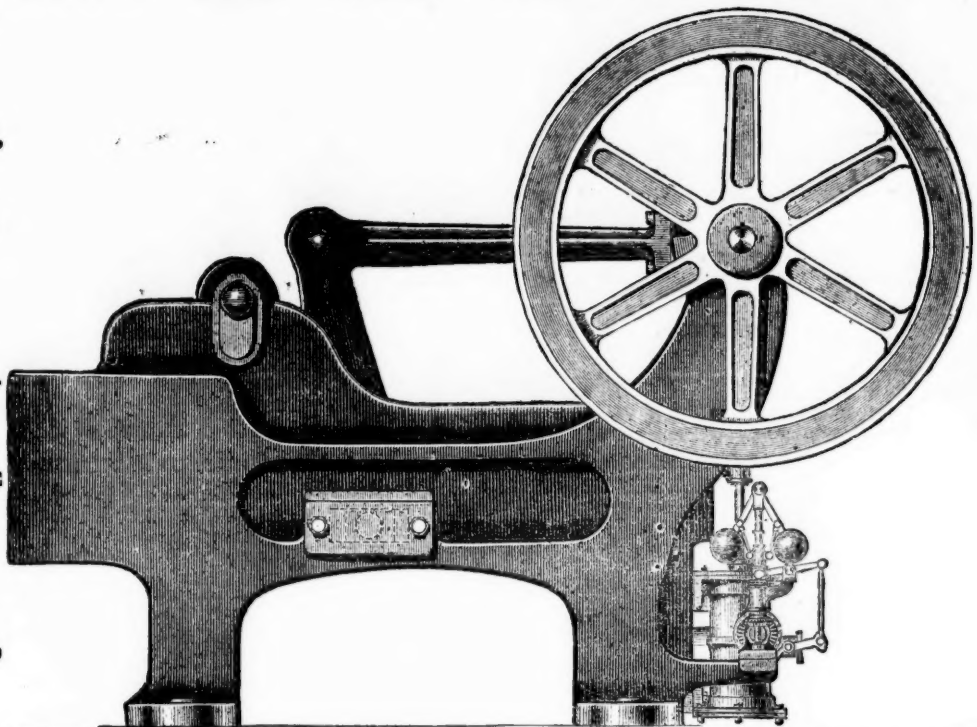
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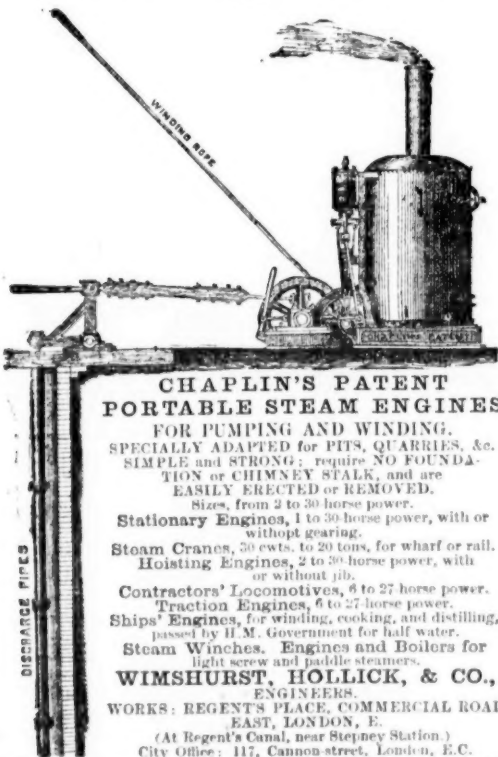
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